

Wm. Chalmers 1720
Ex dono Jac. Chalmers Typog
Compleat Surgeon :

O R, T H E
Whole Art of SURGERY explain'd
Libet Societ. Medica Abdon
in a most Familiar Method.
Containing

An exact Account of its Principles and several Parts,
viz. Of the Bones, Muscles, Tumours, Ulcers, and
Wounds, simple and complicated, or those by Gun-shots;
as also of Venereal Diseases, the Scurvy, Fractures,
Luxations, and all sorts of Chirurgical Operations.

To which is added,

A Chirurgical Dispensatory; shewing the manner how
to prepare all such Medicines as are most necessary
for a Surgeon, and particularly the *Mercurial*
Panacea.

Written in French by M. Le Clere, Physician in Ordinary
to the French King; and faithfully Translated
into English.

The Third Edition, Enlarged by the Author; with the
Excellent Method of Preparing the Brain, by that
Dextrous and Learned Anatomist M. Duncan. And
with many Judicious Remarks, and New Chirurgical
Machines of the Invention of the Ingenious and Skill-
ful M. Arnaud.

L O N D O N :

Printed for W. Freeman, J. Walther, T. Goodwin,
M. Watton, and R. Parker. 1701.

Compendium Chirurgicum



Whole Art of Surgery explained in a most methodical manner

Containing

An exact Account of the Principles and several Parts of the Art of Surgery, together with the most useful and necessary Rules and Directions for the Management of the Patient, as also of the most difficult Cases, and all sorts of Surgical Operations.

To which is added

A Catalogue of the Diseases, shewing the manner how to prepare the Medicines, and particularly the Manner of preparing a Surgeon, and particularly the Manner of preparing a Surgeon.

Written in French by M. de Clair, Physician in Ordinary to the French King; and faithfully Translated into English.

The Third Edition, Enlarged by the Author; with the Addition of a new Method of preparing the Bones, by that Learned and Famous Anatomist M. Dismont, who with many judicious Remarks, and new Observations, has added to the Treatise of the Injuries and Skill of the Bones.

L O N D O N : Printed for W. Gower, J. Walthoe, T. Godefrid, M. Haden, and R. Parker 1701.

THE
P R E F A C E.

SO great a number of Treatises of Surgery, as well Ancient as Modern, have been already publish'd, that a plenary Satisfaction seems to have been long since given on this Subject, even to the Judgment of the most curious Inquirers. But if it be consider'd, that a young Surgeon ought always to have in view the first Principles of this Noble Art explain'd after a familiar and intelligible manner, it will be soon acknowledg'd, that there is good Reason to set about the Work anew. For besides that the Writings of the Ancients being so voluminous,

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are not portable, they are also very intricate and confus'd: Nay, the whole Art has been so far improv'd and brought to perfection by able Masters in the present Age, that they are now almost become unprofitable.

Some Modern Authors have set forth certain small Tracts, which only explain a few Chirurgical Operations, and on that account deserve only the Name of Fragments. Indeed the Works of some others seem to be sufficiently compleat, but are printed in so large Volumes, and contain so many Discourses altogether foreign from the principal Subject, that they have almost the same Inconveniencies with those of the Ancients. Therefore the Reader is here presented with a small Treatise of Surgery, yet very plain and perspicuous, in a portable Volume; being

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ing free from a multiplicity of impertinent Words, and containing every thing of moment that has been produc'd by the most approv'd Authors both Ancient and Modern.

An Introduction is made into the Matter by small Colloquies or Dialogues, to the end that the young Student may be at first led as it were by the Hand; but as soon as he has attain'd to a considerable Progress in these Studies, this innocent and puerile manner of speaking is abandon'd, to conduct him in good earnest to the most sublime Heights of so admirable an Art; to which purpose, after having penetrated into its first Rudiments and Grounds, he is well instructed in Anatomy, and furnish'd with a general Idea of Wounds and Tumours, which are afterward treated of in particular.

THE PREFACE.

ticular. He is also taught a good Method of curing Wounds made by Gun-shot, the Scurvy, and all sorts of Venereal Diseases: From whence he is introduced into the Practice of all manner of Chyrurgical Operations in Fractures and Luxations, together with the use of their respective Dressings and Bandages.

This small Volume is encreased by the Addition of the excellent Method of preparing the Brain by M. Duncan, one of the most learned and curious Anatomists of the Age; and with many Judicious Remarks, and new Chyrurgical Machines of the Invention of the ingenious and well experienced M. Arnaud; whose Merit is own'd to be very great by all knowing Judges. Certainly if that excellent Operator had often occasion of speaking
in

THE PREFACE.

in Publick, the World would rob him of an entire new Surgery; so fruitful he is in Judicious Remarks, Solid Reasonings, and New Inventions.

At the end of the Work is added a Compleat Chirurgical Dispensatory, shewing the Method of preparing such Medicinal Compositions as are chiefly us'd in the Art of Surgery; so that upon the whole Matter it may be justly affirm'd, that this little Manual has all the Advantages of the Ancient and Modern Writings on the same Subject, and is altogether free from their Superfluities and Defects.

BOOKS

The Preface

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 their Superfluities and Defects.



BOOKS

*the Royal Hospitals about Paris
Faithfully done into English.*
*A Description of Bandages and
Dressings according to the
M. de la Clerc, Physician*
**BOOKS Printed for J. Walthoe,
T. Goodwin, M. Wotton, and
R. Parker.**

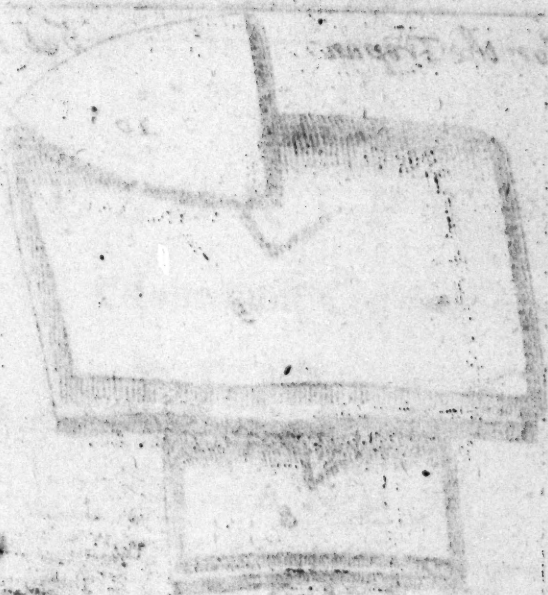
A Compleat Body of Chirurgical Operations: Containing the whole Practice of Surgery; with Observations and Remarks on each Case. Amongst which are inserted the several Ways of Deliyering Women in Natural and Unnatural Labours. The whole illustrated with Copper Plates, explaining the several Bandages, Sutures, and divers useful Instruments. - By *M. de la Vauguion*. M. D. and Intendant of the

the Royal Hospitals about *Paris*
Faithfully done into *English*.

A Description of Bandages and
Dressings, according to the most
Commodious Ways now used in
France. Written in *French* by
M. Le Clerc, Physician in Ordina-
ry to the *French* King, and Au-
thor of the *Compleat Surgeon*. Tran-
slated into *English*. With Forty-
eight Copper Plates, representing
the Figures of the several Parts of
each Dressing.

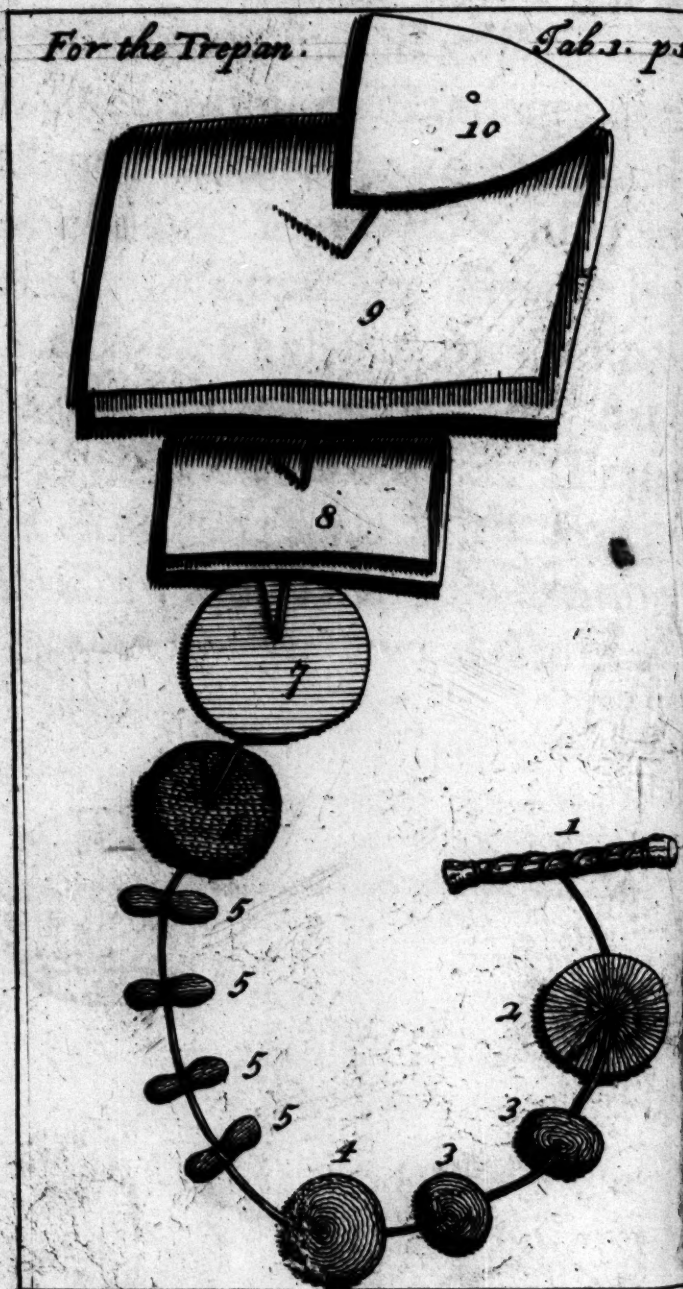
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For the Trepan.

Tab. 3. p. 3



I

A

DESCRIPTION
Of the most Commodious
BANDAGES
AND
DRESSINGS.

The Dressings after Trepanning.

Trepanning is the Perforation of the Skull to discharge Matter supposed to be lodged on the *Dura Mater*; and this cannot be made without wounding the Teguments; therefore proper Dressings are requir'd, which are here represented. See Tab. I.

1. A False Tent made of Lint, in which a Lancer is conceal'd for the piercing the *Dura Mater*, when the Surgeon thinks there is Pus beneath.

2. A

2. A Syndon of Lint, which is to pass thro' the Hole of the Skull, and must be dexterously prest close to the *Dura Mater* with the Lenticular Instrument.

The Syndon must be applied even, flat, and close to the *Dura Mater*, lest its Inequalities pressing the Membrane, should cause a dangerous Inflammation.

The Syndon must be a little larger than the Hole of the Skull, that so the Remedies may diffuse themselves on the *Dura Mater*; and it may not suffer any Contusion when the Brain in its Dilatation beats on the Edges of the Hole.

Before you introduce the Syndon, steep it in a Mixture of Spirit of Wine and Honey of Roses; for the applying Oils and greasie Medicines is apt to occasion Excrescencies or *Fungus's*. When these arise, you must use Desiccatives, as Spirit of Wine and Tincture of Aloes; and if these are not sufficient to dispel them, have Recourse to Powder of Turpentine, *Iris Florentina* or Burnt Alum. Be sure to prest these Powders a little on the *Dura Mater*, with the Lenticular Instrument.

After the use of these Remedies, steep your Syndon in a Decoction of the Vulnerary Plants boil'd in White Wine, adding a little Honey of Roses.

To make this Syndon, take in your Right Hand some good soft Lint, draw as much of it as may be about the Thickness of a Goose-Quill, between the Thumb and the Fore-Finger of the Left Hand; then tie this snail Packet of Lint in the middle with a Thread: next spread the Lint round like so many Rays, and cut it into a circular Form a little greater than the Hole made by the Trepan.

Be-



Bandages and Dressings.

3

Before you apply it, you must steep it in some convenient Liquor; the most spirituous are best, because they are Resolutives, and hinder Putrefaction: Those which are oily stop the Pores, lessen Transpiration, and occasion Inflammation, as was before noted.

Before you apply the Syndon, you ought to tie it with a Thread, which may hang out over the Skull, that so you may draw it out at the next Dressing. This is done by way of Precaution, lest it shou'd slip under the Bones between the *Dura Mater* and the Skull, whither it might be forc'd by the *Systole* and *Diastole* of the Membrane, especially when the wounded Person is very ancient; for we know that in these People the *Dura Mater* is tied to the Sutures; and that almost every where else there is a Space between the *Cranium* and it, into which the Syndon may slip; and if such an Accident shou'd happen, there wou'd be an Extraneous Body, which wou'd require a new Operation.

Some prefer a Syndon made of a small Bit of a soft Rag cut round, to one of Lint, for fear lest some of the Threads shou'd get under the Skull, and create troublesome Accidents.

3. Small round Pledgits of Lint made about the Bigness of the Hole, which are to be laid one on another over the Syndon, that there may not be any empty Space in the Hole; press these softly with the Lenticular Instrument without too much stress on the *Dura Mater*.

I say that the Hole ought to be well fill'd with Pledgits, because it sometimes happens that the *Dura Mater* is inflam'd, and comes out, which causes ill

Ac-

Accidents, and very much embarasses the Surgeon ; for not to mention the Difficulty of putting it back, it corrupts, mortifies, and in such case must necessarily be cut off.

Observe that you must wet the Pledgits with which you fill the Hole of the Trepan, in some spirituous Liquor.

4. A dry Pledgit is to be apply'd over the Hole immediately on the Bone ; for you must never apply Medicaments on the Bones, unless you desire to procure an Exfoliation ; in which case Oil of *Guaiacum* and Tincture of *Euphorbium* are excellent ; and must then be procur'd, when you desire the Flesh shou'd grow to cover the Orifice of the Skull.

5. Small Dossils of Lint dipt in a good Digestive made with Yolks of Eggs, Turpentine and Oil of Roses, to be put within the Lips of the Wound, to procure Suppuration and suppress the too quick Growth of the Flesh, and prevent its covering the External Orifice too soon ; for the Wound must never be cicatrized till the Hole is fill'd with a *Callus*, which is about forty or fifty Days after the Operation.

If in spite of the Digestive, the Flesh grows too luxuriantly, you must touch it with the *Lapis Infernalis*, and lay a dry Pledgit on it, leaving it till the next Dressing.

Observe that the large Digestion of the External Wound does extremely ease the *Dura Mater*, by reason of the Communication between the External and Internal Vessels. Observe likewise

Bandages and Dressings.

5

wife that you must shave the Head, and embrocate it well with Oil of Roses, and Spirit of Wine.

6. A large Pledgit arm'd with a good Digestive made with Yolks of Eggs, Turpentine and Oil of Roses, which is to be applied over the whole Wound.

7. A Large Emplaster to be applied over all the above-nam'd Dressings.

8. A Compress of Linnen Raggs in four Doubles to be laid over the whole Part, as well for preserving it warm as the keeping on all the Dressings.

9. A large Napkin to make the Bandage, called the *Great Cap*, if you are not contented with the Folded Handkerchief.

To make this, take a large Napkin more oblong than square; double it length-ways in the middle, and leave one of its Ends four or five Fingers breadth longer than the other: Apply the middle of the Napkin on the Patient's Head, so that the longest side may immediately touch it; Order a Servant to lay his Hand on the Dressings, which he must do very gently, for fear of discomposing them; whilst the Bandage is making, cause the upper Ends to be held under the Patient's Chin, whilst you take the two lower Ends, to wit, one in each Hand, and draw them Horisontally on each side, that so you may raise the depending part of the Napkin over the Forehead; then cross the two Ends of the Napkin

kin which you have hold of behind the Head, that so there may be no Wrinkles; bring them forward, and pin them at their Extremities. In this manner there will remain one End of the Napkin on each Shoulder, which you must handsomely raise over the Head, bringing them near the Eyes and then fasten the two Ends which your Assistant held under the Patient's Chin, either by tying them in a Knot or pinning them. This Bandage, if it be well made, makes a Figure not much unlike a Helmet. If this does very much embarrass, you may make the Bandage with a fine Napkin folded Diagonalwise, or in a Triangular Form: Take this in the middle with your two Hands, your two Thumbs being on the Fold one over-against the other: Apply the middle of the Napkin on the Patient's Forehead; bring your two Ends behind the Head, sliding the Hand all along the Napkin; bring back the two Ends over the Forehead, having engaged the two other Ends underneath behind the Head; lastly, pin the two Ends, which you have brought back where they terminate,

You must take care to make as few Pleats as may be; for the Patient's Head is pain'd, and the least Inequalities hurt it when it lies on the Pillow. This Bandage is easie, and any one can make it; and it may suffice for almost all Cases of the Head, where *Galen* employs fourscore or a hundred, which are very difficult to retain for those who are not daily conversant in them.

10. Over all these Dressings put a woollen Cap big enough to receive them without compressing the

the 'Emplaisters sticking to the Hair, would create a great deal of trouble in the taking them off; besides, these hinder the Remedies from taking effect, and the slovenliness of this would offend the Bystanders.

The more Nasty any Business is, the more necessary is it to do every thing nearly; and therefore when you take off any Pledgits or Emplaisters, take care not to throw them on, or under the Bed, or on the Floor, for fear you meet with some Affront from the Servants, but rather order a Chair or Plate to lay your Dressings on. Take care to double the Emplaster, that the Bystanders may not see the Pus, which would offend them and make them condemn you as a Sloven. And when you look upon the Pledgits, which you must not fail to do, that you may judge of the Quality of the Pus and the Condition of the Wound, this must be done with a Cast of an Eye, and dextrously concealed from the Persons by, that it may not give offence to them.

Before you take off the Dressings, you must always cleanse the Edges of the Wound with the side of your *Spatula*; for if you should defer this till afterward, you would leave it too long exposed to the Air, and this would be dangerous, because the Nitre fixes in it, and its Caustick Salts corrode the Wound; and if you should omit to cleanse it at all, small Ulcers would form themselves under this Crust, which you would not discern.

Before you take off one Dressing, the other must be in a readiness, that so the Wound may

may not be left open ; and if after it be opened, there shall remain any thing to be done, lay a Rag over it to defend it from the Action of the Air.

You must never wipe an Emplaster and apply it a second time to a Wound, for besides that is slovenly, it is impregnated with several Acids from the Wound, which will re-enter it, and increase the Malady.

When the Rollers have imbibed much of the Pus, you must put them in a Bucket, and not dry them at the Fire, as is done in some Hospitals, for this is a dangerous Practice for the Reasons above mentioned.

To take off the Pus from a Wound, you must not wipe it, but lay a Rag of fine Linnen on it, and press this softly with a little Lint, especially when the Wound begins to look well ; for if you should wipe it, you would in a very small time undo what Nature has been a long time finishing.

If there be Sinuosities, you must syringe it with some convenient warm and spirituous Liquor, rather than persist to cleanse it with Rags and Tents, which cannot be done without pain.

When you take off an Emplaster, take hold of it by one Corner, and draw it off pretty quick. If you should draw it hastily it would create too much Pain, which is to be avoided as much as may be ; and besides this, you might carry away with it some of the new-form'd Flesh : On the contrary, If you should do this slowly, you would keep the Patient too long on the Rack, and therefore you must observe

serve a Middle between the two Extrems

Remember ever not to apply Dressings dry on a Fracture or Dislocation, but steep your Roller, Compresses, &c. in Wine well warmed or Oxycrate; for so every Thing will sit more close and neat; and these Liquors serve as defensatives to strengthen the Part, and prevent Fluxion.

For the greater neatness, take off the Pledgits which have the Pus on them, with your Forceps, to prevent soiling your Hands, which would be offensive to the Bystanders,

Lint is made of old Rags, and yet they must not be too much worn neither; because the Threads breaking and being too short, the Pledgits are harder to make, and do not hold so well together.

To make Lint, (for I speak to young Learners who know nothing at all) cut bits of Rags square, as large or larger than the Palm of the Hand; take one of these Bits in your left Hand, and with the other Hand draw it Thread by Thread; if the Pieces of Cloth are too large, the Threads cannot be so well drawn. These Threads you must range by the sides of one another, and not entangle them; for when they are mixed together, it is hard to make handsom Pledgits.

Take a handful of the Lint, more or less in proportion to the Pledgit you would make, and comb or draw it in the other Hand, clapping your Thumb on it to keep it whilst you are drawing it. Observe that the Threads must by no means be placed all parallel, that is, one by the sides of the other, but must cross from

time to time to keep the Pledgit the better together. When you have well enough drawn the Lint, turn it quite round to raise the Ends of the Threads, and cast them back with your Thumb, or the Back of your Hand over the Pledgit; when this is done, apply it on the Back of the Hand, and with the Flat of the other Hand rub it till it be firm and close.

Pledgits are made round, long or oval, as Occasion requires.

To make a Dossil, take the Lint in your Right Hand, and draw it between your Thumb and the Fore-Finger of your Left Hand in Proportion to the Bigness you would have the Pledgit of; bend this small Packet in the midst, and raise the Ends, and roll this Dossil very strongly between both Hands to make it firm. It is a Rule that you must always tie the Dossils in the middle with a Thread, when you put them into Wounds where you think it will be difficult to draw them out, or apprehend that you may forget and leave them in, as it happens in deep *Sinus*; for the Flesh would grow over them, and the Wound cicatrize; but it would break out again, and the Relapse would be worse than the first Grievance.

Tents of Lint are made like Dossils, except that they are cut and shaped at the End with a sort of a Cap, not unlike the Head of a Clove. These are made to put into small Orifices to keep them open, to give a Discharge to the Matter.

Great Tents of Cloth are made of small square Bits of Raggs, in this manner: Take one of these by its Angles, and roll it between the
Thumb

Thumb and Fore-Finger of the Right Hand, so that one of its Ends be pointed, and that the other grow bigger ; then take another of these Raggs, and roll it on the former, and continue to do thus till the Tent be thick enough ; cut the lesser End to make it blunter, for fear it hurt the Parts ; snip the thick End transversally ; then give it a Cut with your Scissors lengthways, for the forming a Head or Cap ; and lastly tie it with a Thread of Lint. This Tent is to be introduc'd into large Orifices, as between the Ribs in an *Empyema*, or into the Perforation in the Rings of the Muscles in a *Bubonocèle*, &c.

It often happens that a Bandage may be made either with a Roller roll'd with one or two Heads. When this happens, the former is to be preferr'd, as being less troublesome.

To make a neat, close and fine Bandage, the Roller must not be too broad ; for then it will be loose on the Sides.

Some Rollers are very narrow, others very broad, others of a middle condition. For the right using of a very narrow Roller, you must begin by folding it at the End ; then keep it between the Thumb and Fore-Finger of the Left Hand ; put the other End in the Right Hand, between the little Finger and the Ring-finger ; hold it firm ; then put the Thumb of the Right Hand on its Head, and the Fore-finger beneath, and roll it very firmly between the two Thumbs and the two Fore-Fingers.

For one of the middle sort of Rollers, keep it between the Fingers of the Left Hand and the Mount of *Venus*, putting the Thumb of the Right

Right Hand on its Head, and the Fore-finger beneath.

For such Rollers as are very large, put them between the Fingers of both Hands, as Shopkeepers do their Ribbons. This Method may serve for all sorts of Rollers, being the most convenient and simple.

As you proceed in undoing the Roller you must gather it to a Heap to prevent it being troublesome, as it would be if it lay all abroad.

In taking off or applying the Dressings, the Surgeon must shew a Tenderness, and not say or do any thing which may discover a Cruelty or Temper. If the Patient be naturally Hypochondriack or melancholy, do it as quick as may be and do not amuse your self with talking with him ; for these People bear a mortal Hatred to all Doctors and Surgeons.

I say you ought to be tender, but not pitiful. For however a Patient may love to be gently dealt with, he had rather be cured ; and if a Surgeon discover much Compassion, they apprehend this will hinder him from doing his Duty ; or at least will conclude he has not been very conversant in the Business of his Profession.



I

T H E
Compleat Surgeon :
O R, T H E
W h o l e A R T
O F
S U R G E R Y
E X P L A I N ' D, &c.

C H A P. I.

*the Qualifications of a Surgeon, and
of the Art of Surgery.*

W H O is a Surgeon ?
A Person skill'd in curing Diseases
incident to Humane Bodies by a me-
dical Application of the Hand.

*What are the Qualifications of a good Surgeon in
general ?*

B

They

The Compleat Surgeon.

They are three in Number : viz Skill in the Theory, Experience in the Practical Part, and a gentle Application of the Hand.

Why ought a Surgeon to be skilful ?

Because without a discerning Faculty he can have no certainty in what he doth.

Why must he be experienc'd ?

Because Knowledge alone doth not endue him with a dexterity of Hand requisite in such a Person, which cannot be acquired but by Experience, and repeated Manual Operations.

Why must he be tender-handed ?

To the end that by fit Applications he may assuage those Pains which he is oblig'd to cause his Patients to endure.

What is Chirurgery or Surgery ?

It is an Art which shews how to cure the Diseases of Humane Bodies by a methodical Manual Application. The Term being deriv'd from the Greek Word *Χειρ*, signifying a Hand and *Εργον*, a Work or Operation.

After how many manners are Chirurgical Operations usually perform'd ?

Four several ways.

Which be they ?

I. *Synthesis*, whereby the divided Parts are re-united ; as in Wounds. II. *Diuresis*, that divides and separates those Parts, which, by their Union, hinder the Cure of Diseases, such is the continuity of the Skin or Flesh in Abscesses, or Impostumes, which must be open'd to let out the purulent Matter. III. *Exeresis*, which draws out of the Body whatsoever is noxious or hurtful, as Bullers, Arrows, &c. IV. *Prosthesis* which adds some Instrument or Body to supply the



The Compleat Surgeon.

3

the defect of those that are wanting; such are Artificial Legs and Arms, when the Natural ones are lost. It also furnishes us with certain Instruments to help and strengthen weak Parts, such as *Pessaries*, which retain the *Matrix* in its proper Place when it is fallen, Crutches to assist feeble Persons in going, &c.

What ought to be chiefly observed before the undertaking an Operation?

Four things; *viz.* 1. What the Operation to be perform'd, is? 2. Why it is perform'd? 3. Whether it be necessary or possible? And 4. The manner of performing it.

How may we discern these?

The Operation to be perform'd may be known by its Definition; that is to say, by explaining what it is in it self: We may discover whether it ought to be done, by examining whether the Distemper cannot be cur'd otherwise: We may also judge whether it be possible or necessary, by a competent Knowledge of the Nature of the Disease, the Strength of the Patient, and the Part affected: Lastly, the manner of performing it may be found out, by being well vers'd in the Practice of Surgery.

What are the Fundamental Principles of Surgery?

They are Three in Number: *viz.* 1. The Knowledge of Man's Body. 2. That of the Diseases which require a Manual Operation. 3. That of proper Remedies and Helps upon every Occasion.

How may one attain to the Knowledge of Humane Bodies?

B 2

By

By the study of Anatomy.

How may one learn to know the Distempers relating to Surgery, and the Remedies appropriated for them?

Two several ways; viz. 1. By the reading of good Books, and Instructions receiv'd from able Masters of that Art. 2. By Practice and the Observation of what is perform'd by others upon the Bodies of their Patients.

What are the Diseases in general that belong to Surgery?

They are Tumours, Impostumes, Wounds, Ulcers, Fractures, Dislocations, and generally all sorts of Distempers whereto Manual Operations may be applied.

What are the Instruments in general which are commonly used in Surgery for the curing of Diseases?

They are Five; viz. the Hand, Bandages, Medicines, the Knife, and Fire.

What is the general Practice which ought to be observ'd in the Application of these different helps?

Hippocrates teacheth us, in saying, that when Medicines are not sufficient, recourse may be had to the Knife, and after that to Fire; intimating that we must proceed by degrees.

Are there any Distempers that may be cured by the Surgeon's Hand alone?

Yes, as when a simple and small Dislocation is only to be reduced.

CHAP. II.

Of Chirurgical Instruments, portable and not portable.

What do you call portable and not portable Instruments?

Portable Instruments are those which the Surgeon carries in his Lancer-Case with his Plaster-Box; and not portable are those that he doth not carry about him, but is oblig'd to keep at home; the former being appointed for the ready help which he daily administers to his Patients, and the others for greater Operations.

What are the Instruments which a Surgeon ought to have in his Plaster-Box?

These Instruments are a good pair of *Sizzers*, a *Razor*, an *Incision-Knife* streight and crooked, a *Spatula*, a greater *Lancet* to open *Impostume* and lesser for letting *Blood*. They likewise carry separately in very neat Lancer-Cases, a hollow *Probe* made of *Silver* or fine *Steel*; as all many other *Probes*, streight, crooked, folding, and of different thickness; a *Pipe* of *Silver* or fine *Steel*, to convey the cauterizing *Burton* to a remote Part, without running the hazard of burning those that are near it; another *Pipe* or *Tube* serving instead of a Case for *Needles*, which have *Eyes* at one end for sowing; a *Carlet*, or thick triangular *Needle*; a small *File*; a *Steel* Instrument to cleanse the *Teeth*; a
B 3
Fleam;

Fleam ; a pair of crooked *Forceps* to draw a *Tooth* ; a *Pelican* ; a *Crow's Bill* ; a *Senticular Instrument* ; a *Hook* to hold up the *Skin* in cutting. &c.

What are the Instruments which a Surgeon ought to keep in his Repository to perform the greater Operations ?

Some of them are peculiar to certain Operations, and others are common to all. The Instruments appropriated to particular Operations, are the *Trepan* for opening the *Bones* in the *Head*, or elsewhere : The *Catheters* or *Probes* for Men and Women afflicted with the *Stone*, or difficulty of making *Water*. *Extractors*, to lay hold on the *Stone* in *Lithotomy*, small *Scoops* to fetch away the *Gravel* ; large crooked *Incision-Knives*, and a *Saw* for *Amputations* of the *Arms* or *Legs* ; great *Needles* with three *Edges*, for making *Setons* ; small *Needles* to couch *Cataracts* ; other *Needles* ; thin *Plates* and *Buckles* to close a *Hair-Lip*, &c.

May not the Salvatory be reckon'd among the portable Instruments ?

Yes, because the *Balsams*, *Ointments*, and *Plaisters* contain'd therein, are means whereof the *Surgeon* makes use to restore *Health*.

C H A P. III.

Of Anatomy in general; and in particular of all the Parts whereof the Humane Body is compos'd.

W H A T is Anatomy?

It is the *Analysis* or exact Division of all the Parts of a Body, to discover their Nature and Original.

What is requisite to be observ'd by a Surgeon before he goes about to dissect a Body?

Two things; *viz.* The external Structure of the Body, and the Proportion or Correspondence between that and the Parts.

Why so?

Because without the Knowledge of the Surface and external Parts, a Surgeon wou'd be often mistaken in the Judgment he is to pass concerning a Dislocation or Wound, inasmuch as it is by the Deformity which he perceives in the Member, that he knows the Dislocation, as it is also by the means of the Correspondence which the outward Parts have with the inward, that he is enabled to draw any certain Consequences relating to a Wound, which penetrates into the Body.

What is a Part?

It is that whereof the whole Body is compos'd, and which partakes of a common Life or Sensation with it.

How many sorts of Parts are there in a Humane Body?

We may well reckon up Fifteen distinct Parts, which are the Bone, the Cartilage, the Ligament, the Tendon, the Membrane, the Fibre, the Nerve, the Vein, the Artery, the Flesh, the Fat, the Skin, the Scarf-Skin, the Hair, and the Nails.

What is a Bone?

It is the hardest and driest Part of the whole Body, and that which constitutes its principal Support.

What is a Cartilage or Gristle?

It is a yielding and supple Part, which partakes of the Nature of a Bone, and is always fastned to its Extremities, to render its Motion more smooth and easie.

What is a Ligament?

It is a Membranous Contexture usually sticking to the Bones to contain them; as also sometimes to other Parts, to suspend and retain them in their proper Place.

What is a Tendon?

It is the Tail or Extremity of the Muscles, made by the re-union of all the Fibres of their Body, which serves to corroborate it in its Action, and to give Motion to the Part.

What is a Membrane?

It is a Nervous Part, the use whereof is to adorn and secure the Cavities of the Body on the inside, and to wrap up or cover the Parts.

What is a Fibre?

They are fleshy Lines of which the Body of a Muscle is composd.

What is a Nerve?

It is a long, white, and thin Body, consisting

of

of many Fibres, enclos'd within a double Tunick, and design'd to carry the Animal Spirits into all the Parts, to give them Sense and Motion.

What is an Artery?

It is a Canal compos'd of four Coats, that carrieth with a kind of Beating or Pulse, even to the very Extremity of the Parts, the Blood full of Spirits, which proceeds from the Heart, to distribute to them at the same time both Life and Nourishment.

What is a Vein?

It is a Canal made likewise of four Tunicks, which receives the Arterial Blood, to carry it back to the Heart.

What is Flesh?

It is a Part which is form'd of Blood thickened by the natural Heat; and that constitutes the Body of a Muscle.

What is Fat?

It is a soft Body made of the Unctuous and Sulphurous part of the Blood.

What is the Derma or Skin?

It is a Net-like Contexture, compos'd of Fibres, Veins, Arteries, Lymphatick Vessels and Nerves, which covers the whole Body, to defend it from the Injuries of the Air, and to serve as an universal Emunctory: It is very thin in the Face, sticking close to the Flesh, and is pierc'd with an infinite number of imperceptible Pores, affording a Passage to insensible Transpiration.

What is the Epiderma, or Scarf-skin?

It is a small fine Skin, transparent and insensible, having also innumerable Pores for the discharging of Sweat and other Humours by im-

perceptible Transpiration: It is extended over the whole inner Skin, to dull its too exquisite Sense, by covering the Extremities of the Nerves which are there terminated. It also renders the same Skin even and smooth, and so contributes very much to Beauty.

What is the Hair?

The Hair are certain hollow Filaments planted in the Glandules of the Skin, from whence their Nourishment is deriv'd. They are the Ornament of some Parts, cover those which Modesty requires to be conceal'd, and defend others from the Injury of the Weather.

What is a Nail?

The Nails are a Continuity of the Skin harden'd at the end of the Fingers, to strengthen and render them fit for Work.

C H A P. IV.

Of the General Division of a Humane Body.

HOW is the Humane Body divided before it is dissected, in order to Anatomical Demonstration?

Some Anatomists distinguish it into *Similar* and *Dissimilar* Parts, appropriating the former Denomination to all the simple Parts of the Body taken separately, as a Bone, a Vein, a Nerve, &c. but they attribute the Name of *Dissimilar* to all those Members that are compos'd of many *Similar* or *Simple* Parts together; such are the Arms, Legs,

Legs, Eyes, &c. wherein are contain'd all at once, Bones, Veins, Nerves, and other parts.

Others divide it into *containing* and *contained* Parts, the former enclosing the others, as the Skull includes the Brain, and the Breast the Lungs; whereas the contained Parts are shut up within others; as the Entrails within the Belly, the Brain within the Skull, &c.

Others again divide the whole Body into *Spermatick* and *Sanguineous* Parts; the former being those which are delineated in the first Formation; and the latter those accessory ones which are made of the Nutriment supplied by the Blood.

Are there not also other Methods of dividing the Humane Body?

Yes: Many Persons consider it as a Contexture of Bones, Flesh, Vessels and Entrails, which they explain in four several Treatises, whereof the first is called *Osteology*, for the Bones; the second *Myology*, for the Muscles; the third *Angiology*, for the Veins, Arteries and Nerves, which are the Vessels; and the fourth *Splanchnology*, for the Entrails.

But lastly, the most clear and perspicuous of all the Divisions of the Body of Man, is that which compares it to a Tree, whereof the Trunk is the Body, and the Branches are the Arms and Legs. The Body is divided into three *Venters*, or great Cavities, *viz.* the Upper, the Middle, and the Lower, which are the Head, the Breast, and the lower Belly. The Arms are distributed into the Arms properly so called, the Cubit and Hands; and the Legs in like manner into Thighs, Legs, and Feet: The Hands

Hands being also subdivided into the *Carpus* or Wrist, *Metacarpus* or back of the Hand, and the Fingers; as the Feet into the *Tarsus*, *Metatarsus*, and Toes. This Division is at present follow'd in the Anatomical Schools.

CHAP. V.

Of the Skeleton.

WHY is Anatomy usually begun with the Demonstration of the Skeleton, or Contexture of Bones?

Because the Bones serve for the Foundation, Connexion, and Support of all other Parts of the Body.

What is the Skeleton?

It is a gathering together, or Conjunction of all the Bones of the Body almost in their natural Situation.

From whence are the principal Differences of the Bones derived?

They are taken from their Substance, Figure, Articulation, and Use.

How is all this to be understood?

First then, with respect to their Substance, there are some Bones harder than others; as those of the Legs compared with those of the Spine of the Back. Again, in regard of their Figure, some are long, as those of the Arm; and others short, as those of the *Metacarpus*. Some are also broad, as those of the Skull and Scapula.

pule or Shoulder-blades ; and others narrow, as the Ribs. But with respect to their Articulation, some are joined by thick Heads, which are received into large Cavities, as the Thigh-bones with those of the Hips ; and others are united by the means of a simple Line, as the Chin-bones. Lastly, with relation to their Use, some serve to support and carry the whole Body, as the Leg-bones, and others are appointed to grind the Meat, as the Teeth ; or else to form some Cavity, as the Skull-bone, and those of the Ribs.

What are the Parts to be distinguished in the Bones ?

They are the Body, the Ends, the Heads, the Neck, the *Apophyses*, or *Processes*, the *Epiphyses*, the *Condyl*i or Productions, the Cavities, the *Supercilia* or Lips, and the Ridges.

The Body is the greatest part, and the middle of the Bone ; the Ends are the two Extremities ; the Heads are the great Protuberances at the Extremities ; the Neck is that Part which lies immediately under the Head ; the *Apophyses* or *Processes* are certain Bunches or Knobs at the Ends of the Bones, which constitute a Part of them ; the *Epiphyses* are Bones added to the Extremities of other Bones ; the *Condyl*i or Productions are the small Elevations or Extuberances of the Bones ; the Cavities are certain Holes or hollow places ; the *Supercilia* or Lips are the Extremities of the Sides of a Cavity, which is at the End of a Bone ; the Ridges are the prominent and saliant Parts in the length of the Body of the Bone.

How

How are the Bones joined together ?

Two several ways, viz, by *Articulation* and *Symphysis*.

How many sorts of Articulations are there in the Bones ?

There are generally two kinds, viz. *Diarthrosis* and *Synarthrosis*.

What is Diarthrosis ?

Diarthrosis is a kind of *Articulation* which serves for sensible *Motions*.

How many kinds of Diarthroses or great Motions are there ?

There are three, viz. *Enarthrosis*, *Arthrodia*, and *Ginglymus*.

Enarthrosis is a kind of *Articulation* which unites two *Bones* with a great *Head* on one side, and a large *Cavity* on the other ; as the *Head* of the *Thigh-bone* in the *Cavity* of the *Iscion* or *Huckle-bone*.

Arthrodia is a sort of *Articulation*, by the means whereof two *Bones* are join'd together with a flat *Head* receiv'd into a *Cavity* of a small depth. Such is the *Head* of the *Shoulder-bone* with the *Cavity* of the *Scapula* or *Shoulder-blade* ; and that of the twelfth *Vertebra* of the *Back* with the first of the *Loins*.

Ginglymus is a kind of *Articulation* which unites two *Bones*, each whereof hath at their *Ends* a *Head* and a *Cavity*, whereby they both receive and are received at the same time, such is the *Articulation* in the *Bones* of the *Cubit* and *Radius*, and the *Vertebrae*.

What is Synarthrosis ?

Synarthrosis being opposite to *Diarthrosis*, is a close

close or compacted Articulation, destitute of any sensible Motion.

How many sorts of Synarthroses, or close Articulations are there ?

There are three, viz. *Sutura*, *Harmonia*, and *Gomphosis*.

A *Suture* is that which joins together two Bones by a kind of Seam or Stitch, or by a Connexion of their Extremities dispos'd in form of a Saw, the Teeth whereof are reciprocally let one into another : Such are the Sutures of the Skull-bones.

Harmonia is the uniting of two Bones by a simple Line ; as the Bone of the Cheek with that of the Jaw.

Gomphosis is a kind of close Articulation, which unites two Bones after the manner of Nails or Wooden Pins fixt in the Holes made to receive them : Such is that of the Teeth in their Sockets.

What is Symphysis ?

Symphysis is the uniting of two Bones by the interposition of a *Medium*, which ties them very streight together, being also threefold : Such is the Connexion of the *Rotula* to the Knee, and of the *Scapula* to the Arm-bone.

Are not these three kinds of Articulations or Symphyses distinguish'd one from another ?

Yes ; for tho' they are all made by the means of a third Body intervening, which joins them together ; nevertheless every one of these various Bodies gives a different Denomination to its respective Articulation : Thus the Articulation which is caus'd by a Glutinous and Cartilaginous Substance, is properly call'd *Synchondrosis*.

drofis; as that of the Nose, Chin, *Os Pubis*, &c. But an Articulation which is made by a Ligament, is termed *Synneurosis*, as that of the Knee-Pan. Lastly, that which is wrought by the means of Flesh, bears the Name of *Syssarcosis*; as the Jaw-bones, the *Os Hyoides*, and the *Scapula* or Shoulder-blade.

Have the Bones any sense of Feeling or Motion?

They have neither; for their sense of Pain proceeds from nothing else but their *Periostium*, or the Membrane with which they are cover'd, and their Motion is perform'd only by the Muscles that draw them.

Do the Marrow afford any Nutriment to the Bones?

No, all the Bones are nourish'd by the Blood, as the other Parts; but the Marrow is to the Bones what the Fat is to the Flesh; that is to say, it is a kind of Oil or Unctuous Substance, which moistens, and renders them less brittle.

Are all the Bones of the same Colour?

No, they follow the Temperament and Constitution of the Persons.

How many in number are the Bones of the Human Skeleton?

There are two hundred and fifty usually reckon'd; viz. sixty one in the Head, sixty seven in the Trunk or Chest, sixty two in the Arms and Hands, and sixty in the Legs and Feet; but the true number cannot be exactly determin'd, by reason that some Persons have more, and others fewer; for some have more *Ossa Sesamoides*, Teeth and Breast-bones than others: Again, some have many indentings in the *Lambdoidal Suture*, and others have none at all. Can

Can you rehearse the number of the Bones of the Head?

There are fifteen in the Skull, and forty six in the Face.

The fifteen of the Skull are the *Coronal* for the fore-part of the Head; the *Occipital* for the hinder-part; the two *Parietals* for the upper-part and each side; the two *Temporals* for the Temples; the *Os Sphenoides* or *Cuneiforme*, which closeth the *Basis* or bottom of the Skull; the *Os Ethmoides*, or *Cribriforme*, situated at the Root of the Nose; and the four little Bones of the Ear on each side; viz. the *Incus* or Anvil; the *Stapes*, or *Stirrúp*; the *Malleolus* or Hammer; and the *Orbicularis* or Orbicular Bone,

Of the forty six of the Face, twenty seven are counted in the Upper-Jaw, viz. the two *Zigomatick*, or the two Bones of the Cheek-Knots; the two *Lachrymal* in the great Corners of the Eyes toward the Nose; the two *Maxillar*, that receive the Upper-Teeth, and which form part of the Palate of the Mouth, and the Orbits of the Eyes; the two Bones of the Nose; the two Palate-bones which are at its end, and behind the Nostrils; the last being single, is the *Vomer*, which makes the Division of the lower part of the Nostrils; and there are generally sixteen Upper-Teeth. The Lower-Jaw contains nineteen Bones, viz. sixteen Teeth; two Bones that receive them; and the *Os Hyoides*, which is single, and fix'd at the Root of the Tongue.

How are the Teeth usually divided with respect to their Qualities?

Into

Into *Incisive* or Cutters, *Canine* or Dog-Teeth, and *Molar* or Grinders. There are eight *Incisive*, and four *Canine*, which have only one single Root; as also twenty *Molar*, every one whereof hath one, two, or three Roots.

Can you recite the number of the Bones of the Trunk or Chest?

There are generally thirty and three in the *Spine* or Chine-bone of the Back, viz. seven *Vertebra's* in the Neck, twelve in the Back, five in the Legs, five, six, and sometimes seven in the *Os Sacrum*, three or four in the *Coccyx*, and two *Cartilages* at its end.

There are twenty nine in the Breast, viz. twenty four *Ribs*, two *Clavicles* or Channel-bones, and commonly three Bones in the *Sternum*. The *Hip-bones* are likewise divided into three, viz. *Ilion*, *Ischion*, and *Os Pubis*.

Do you know the number of the Bones of the Arms?

There are thirty and one Bones in each Arm, that is to say, the *Scapula* or Shoulder-blade; the *Humerus* or Shoulder-bone; the two Bones of the Elbow call'd *Ulna*, and *Radius*; eight little Bones in the *Carpus* or Wrist; five in the *Metacarpus* or back of the Hand; and fourteen in the Fingers, three to every one except the Thumb, which hath only two.

Can you give us a List of the Bones of the Leg in their Order?

There are thirty Bones in each Leg; viz. the *Femur* or great Thigh-bone, the *Knee-Pan* or *Rotula* on the top of the Knee; the *Tibia*, greater *Focile*, or Shin-bone; and the *Perone* or *Fibula*.

Fibula, or *lesser Focile*, which are the two associated Bones of the Leg; seven little Bones in the *Tarsus*; five in the *Metatarsus*; and fourteen in the Toes; that is to say, three to every one, except the great Toe, which hath only two.

Thus the number of Bones in the Humane *Skeleton* amounts to two hundred and fifty, without reckoning the *Sesamoidea*, the Interstitial Bones between the Sutures of the Skull, and some others, which are not always to be found.

CHAP. VI.

Of Myclogy, or the Anatomy of the Muscles of a Humane Body.

WHat is a Muscle?

It is the principal Organ or Instrument of Motion; or it is a Portion of Flesh, wherein there are Veins, Arteries, Nerves, and Fibres, and which is cover'd with a Membrane.

How many Parts are there in a Muscle?

Three, viz. the Head, the Belly, and the Tail: The Head is that part through which the Nerve enters; the Belly is the Body or Middle of the Muscle; and the Tail is the Extremity, where all the Fibres of the Muscle are terminated to make the Tendon or String, which is fasten'd to the Part whereto it gives Motion.

Have

Have all the Muscles their Fibres streight from the Head to the Tail?

No, some have them streight, others transverse, and others oblique or circular, according to the several Motions to which they are appropriated.

How many sorts of Muscles are there with respect to their Action?

There are two different kinds, viz. the *Antagonists* and the *Congenerate*; the former are those that produce opposite Motions; as a *Flexor* and an *Extensor*, a *Depressor* and a *Levator*. The *Congenerate* are those that contribute to one and the same Action; as when there are two *Flexors*, or two *Extensors*, and then one supplies the Defect of the other; whereas when one of the *Antagonist* Muscles is cut, the other becomes useless, and void of Action.

How is the Action of a Muscle perform'd?

It is done by *Contraction* and *Extension*; the former causeth the *Antagonist* to swell, and the other compels it to stretch forth in length.

What is Aponeurosis?

It is the continuity of the Fibres of a Tendon which makes a *Connexion* that serves to strengthen the Muscle in its Motion.

C H A P. VII.

Of the Myology, or Anatomy of the Muscles of the Head.

HOW many Muscles are there appointed to move the Head, and which be they ?

The Head is mov'd by the means of fourteen Muscles, seven on each side ; of these, two serve to depress it, eight to lift it up, and four to turn it round about,

The two Depressors are call'd *Sternoclinomastoidei* ; they take their Rise in the *Sternum*, at the *Clavicles*, and proceed oblique to join the *Apophysis Mastoides*.

Of the Four Elevators on each side, the first is the *Splenius*, which begins at the five *Vertebrae* of the Back, and the three lower ones of the Neck, and ascending obliquely, cleaves to the hinder part of the Head. The second, named *Complexus* or *Trigeminus*, having its beginning as the *Splenius*, sticks in like manner to the hinder part of the Head, and they form together a Figure resembling that of St. *Andrew's Cross*. The third is the *Rectus Major*, which proceeding from the second *Vertebra* of the Neck, shoots forward to join the hinder part of the Head. The fourth is the *Rectus Minor*, which begins at the first *Vertebra* of the Neck, and ends likewise in the hinder part of the Head.

The two Muscles on each side, which move the Head circularly, are the *Obliquus Major* and *Minor* ;

Minor ; the *greater Oblique* taking its rise from the second *Vertebra* of the Neck, goes to meet the first ; but the *lesser Oblique* hath its Origine in the hinder part of the Head, and proceeds to join the other obliquely in the first *Vertebra*.

How many Muscles are there in the Lower-Jaw, and which be they ?

The Lower-Jaw hath twelve Muscles which cause it to move ; that is to say, six on each side, whereof four serve to close and two to open it.

The first of the Openers is the *Latus*, which beginning at the top of the *Sternum*, *Clavicle*, and *Acromion*, cleaves on the out-side to the bottom of the Lower-Jaw-bone. The second of the Openers is the *Digastricus*, which takes its rise in a Fissure lying between the Occipital-bone and the *Apophysis Mastoïdes*, from whence it passeth to the bottom of the Chin on the inside.

The first of the Shuttters is the *Crataphites* or Temporal Muscle, which hath its Origine at the bottom, and on the side of the *Os Coronale*, the *Os Parietale*, and the *Os Petrosum*, from whence it is extended till it cleaves to the *Processus Coronoides* of the Lower-Jaw, after having passed above the *Process* of the *Zigon*. Its Fibres are spread from the Circumference to the Center, and it is covered again with the *Pericranium*, which renders its Wounds very dangerous ; so that the least Incisions possible ought to be made therein.

The second is the *Pterygoideus* or *Aliformis Externus*, whose rise is in the *Apophysis Pterygoïdes*, from whence it sets forward till it stick between the *Condylus* and the Coronal of the Lower-Jaw.

The third is the *Masseter*, which hath a twofold Rise

Rise or Beginning, and as many Insertions; the second Rise thereof is at the Cheek-Knorr or Ball of the Cheek, and the second at the lower part of the *Zygoma*. The first Insertion is at the outer corner of the Jaw, and the second in the middle part; by that means forming the Figure of the Letter X.

The fourth is the *Pterygoideus Aliformis Internus*, which hath its beginning in the *Processus Pterygoideus*, and is terminated in the inner corner of the Jaw; so that Mastication or Chewing is perform'd by the means of these four Muscles.

How many Muscles are there in the Face, and which be they?

There are two for the Forehead, call'd *Frontal*, whose Origine is in the upper part of the Head, from whence they descend by streight Fibres, until they terminate the Skin of the Forehead near the Eye-brows, where they are reunited: Their Action or Office is to draw the Skin of the Forehead upward, whereto they stick very close.

There are also two others call'd *Occipital*, which have their Beginning in the same place with the preceding; but they descend backward, and cleave to the Skin of the hinder part of the Head, which they draw upward.

There are two Muscles to each Eye-lid; one whereof is termed the *Attollens* or *Elevator*, and the other the *Depressor*. The Elevator makes its rise in the bottom of the Orbit of the Eye, and is fastned by a large *Aponeurosis* to the edge of the upper Eye-Lid. The Shutter or Depressor, call'd also the *Orbicular*, hath its Origine in the great *Canthus*, or corner of the Eye, passeth over the Eye-

Eye-Lid upward, and is join'd to the lesser corner of the same Eye, being extended along its whole Compass.

The Eyes have each six Muscles, viz. four *Recti* and two *Obliqui*; the *Recti*, or streight Muscles are the *Elevator*, the *Depressor*, the *Adductor*, and the *Abductor*. The first of these call'd *Elevator*, or *Superbus*, draws the Eye upward, as it is pull'd downward by the *Depressor* or *Humilis*; the *Adductor* or *Bibitorius* draws it toward the Nose, and the *Abductor* or *Indignarorius* toward the Shoulder: All these small Muscles have their Originals and Insertions in the bottom of the Orbit, through which the Optick Nerve passeth, and are terminated in the Corneous Tunicle, by a very large Tendon.

The first of the Oblique ones is term'd the *Obliquus Major*, and the other *Obliquus Minor*, because they draw the Eye obliquely. These Muscles cause Children to squint when they do not act together. The *Oblique Minor* is fasten'd to the outward part of the Orbit near the great corner, and draws the Eye obliquely toward the Nose: But the *Obliquus Major* is fixt in the inner part of the Orbit, and ascends along the Bone to the upper part of the great corner, where its Tendon passeth thro' a small Cartilage nam'd *Trochlea*, and is inserted in the little corner with the lesser *Obliquus Minor*, to draw the Eye obliquely toward the lesser corner.

The Ear, altho' not usually endu'd with any sensible Motion, nevertheless hath four Muscles, viz. one above, and three behind; the first being situated over the Temporal, and fasten'd to the Ear to draw it upward: The three others have their

their beginning in the *Mammillary* Process, and terminated in the Root of the Ear, to draw it backward.

There are also three Muscles in the inner part of the Ear, whereof the external belonging to the *Malleus* or Hammer lies under the exterior part of the Bony Passage which reacheth from the Ear to the Palate of the Mouth, being fixt in a very oblique Sinus which is made immediately above the Bone that bears the Furrow, into which is let the Skin of the *Tympanum* or Drum. The internal Muscle lies hid in a Bony Semi-Canal, in the *Os Petrosus*; one part of which Semi-Canal is without the Drum, and clos'd on the top with a Passage that leads from the Ear into the Palate: But the other part within the Drum advanceth to the *Fenestra Ovalis*, and is inserted in the hinder part of the Handle of the *Malleus*. The Muscle of the *Stapes* or Stirrup is also hid in a Bony Tube, almost at the bottom of the Drum, and fixt in the Head of the *Stapes*.

The Nose hath seven Muscles, that is to say, one common and six proper; the common constitutes part of the orbicular Muscle of the Lips, and draws the Nose downward with the Lip. Of the six proper Muscles of the Nose, four serve to dilate it, being situated on the outside, and two to contract it, which are placed in the inside.

The two first Dilaters of a Pyramidal Figure, take their rise in the Suture of the Forehead, and are fastned by a large Filament to the *Ala* of the Nose. The two other Dilaters resembling a Myrtle Leaf have their Rise in the Bone

of the Nose, and are inserted in the middle of the *Ala*.

The two Restrictors are Membranous, beginning in the internal part of the Bone of the Nose, and adhering to the inner *Ala* of the Nostril.

The Lips have thirteen Muscles, *viz.* eight proper, and five common : Of the proper there are four for the Upper-Lip, and as many for the Lower ; with two common for each, and the odd one.

The first of the proper of the Upper-Lip bears the Name of the *Incisivus*, its Origine being in the Jaw, in the place of the Incisive Teeth and its Insertion is in the Upper-Lip.

The second is the *Triangularis*, Antagonist to the former ; its Rise is on the outside, at the bottom of the lower Jaw ; and it is implanted in the Upper-Lip, near the corner of the Mouth.

The third being the *Quadratus*, springs from the bottom of the Chin before, and cleaves to the edge of the Lower-Lip.

The fourth is the *Caninus*, Antagonist to the *Quadratus*, beginning in the Upper-Jaw-Bone, and being terminated in the Lower-Lip near the corner of the Mouth.

The first of the common is the *Zygomaticus*, the Origine whereof is in the *Zygoma*, and its Insertion in the corner of the Mouth, to draw it toward the Ears ; so that it is this Muscle which acts when we laugh.

The second of the common is the *Buccinator* or Trumperer, which is swell'd when one sounds a Trumper. It hath its Rise at the Root of the Molar Teeth of both the Jaws, and is extended quite round about the Lips.

The

The odd Muscle, or the thirteenth in number, is the *Orbicular*, which makes a *Sphincter* round about the Lips to close or shut them up.

The *Uvula* or *Palate* of the Mouth hath four Muscles, whereof the two first are the *Peristaphylini Externi*, taking their rise from the Upper-Jaw, above the last Molar Tooth, and being ty'd to the *Palate* by a thin *Tendon*.

The two others are the *Peristaphylini Interni*, which have their beginning in the *Processus Pterygoides* on the inside, and likewise stick to the *Palate*.

The *Tongue*, altho' all over Musculous and Fibrous, yet doth not cease to have its peculiar Muscles, which are eight in Number.

The first of these is called *Genioglossus*, taking its rise in the lower part of the Chin, from whence it is extended till it cleave to the Root of the *Tongue* before, to draw it out of the Mouth.

The second is term'd *Styloglossus*, its Rise being from *Processus Styloides*, whence it passeth to the side above the *Tongue*, to draw it up.

The third bearing the Name of *Basoglossus*, commenceth in the *Basis* or Root of the *Os Hyoides*, and thence insinuates it self into the Root of the *Tongue*, to draw it back to the bottom of the Mouth.

The fourth is the *Ceratoglossus*, deriving its Original from the Horn of the *Os Hyoides*, and cleaving to the side of the *Tongue* to draw it on one side: The Action of these Muscles of both sides together, causeth an Orbicular Motion in the *Tongue*. To these some add a fifth Pair of Muscles, call'd *Myloglossus*, which serves to draw it obliquely upward.

What is the Action of the Os Hyoides in the Throat, and how many Muscles hath it?

The use of the *Os Hyoides* is to serve for a support to the Root of the Tongue; and it hath five Muscles on each side, which keep it as it were tied to this Bone.

The first of these, call'd the *Geniohyoideus* hath its beginning in the Chin on the inside, and adheres to the top of the *Os Hyoides*, which it draws upward.

The second is the *Mylohyoideus*, whose Origine is in the inner side of the Jaw, from whence it cleaves side-ways to the Root of the *Os Hyoides*, which it draws upward, and to one side.

The third is the *Stylohyoideus*, which after it hath taken its rise in the *Apophysis Styloides*, is fasten'd to the Horn of the *Os Hyoides*, to draw it toward the side.

The fourth is the *Coracohyoideus*, which springing up from the *Processus Coracoides* of the *Scapula*, cleaves to the Root and side of the *Os Hyoides*, to draw it downward and on one side.

The fifth is the *Sternohyoideus*, that hath its beginning from the Bone of the *Sternum* on the inside, and is inserted into the Root of the *Os Hyoides* which it draws downward.

How many Muscles hath the Larynx?

There are thirteen, viz. four Common, and nine Proper. The first Pair of the Common is the *Sternothyoideus* or *Bronchicus*, which proceeding from the inside, and the top of the *Sternum*, ascends along the Cartilages of the Wind-Pipe, and is terminated in the bottom of the *Scutiformis* or Buckler-like Cartilage, which it draws down-

downward. The second is the *Hyothyroideus*, which arises from the Root of the *Os Hyoides*, and is inserted in that of the *Scutiforme*. This Muscle serves to lift up the *Larynx*, as also to dilate the bottom of the *Scutiformis*, and to close its top.

The first Pair of the Proper is the *Cricothyroideus Anticus*, which deriving its Original from the hinder and upper part of the *Cricoides*, or Ring-like Cartilage, is fixt in the upper and lateral part of the *Scutiformis*, to close or shut it up.

The second is the *Thyroideus*.

The third is the *Cricoarytenoideus Lateralis*, which proceeds from the side of the *Cricoides* within, and is fasten'd to the bottom and side of the *Arytenoides*, which it removes to dilate the Mouth of the *Larynx*.

The fourth is the *Thyroarytenoideus*, which arising from the fore-part on the inside of the *Scutiformis*, is terminated on the side of the *Arytenoides*, to close the Orifice of the *Larynx*.

The fifth is the *Arytenoideus*, which having its Source in that place where the *Cricoides* is united to the *Arytenoides* is inserted in its upper and lateral part, to close the *Larynx*.

How many Muscles hath the Pharynx?

It hath seven, the first whereof is the *Oesophagicus*, which takes its rise from the side of the *Scutiformis* or Buckler-like Cartilage, and passing behind the *Oesophagus* or Gullet, is fasten'd to the other side of the Cartilage. It thrusts the Meat down by closing up the *Pharynx* as a *Sphincter*.

The second named *Stylopharyngeus*, springs from within the Acute Process of the *Os Sphenoides*, or *Cuneiforme*, and is inserted obliquely

in the side of the *Pharynx*, which it dilates by drawing it upward.

The third, call'd *Sphenopharyngæus*, proceeds from the *Apophysis Styloformis*, and is terminated in the side of the *Pharynx*, which it dilates by drawing its sides.

The fourth Pair is the *Cephalopharyngæus*, which ariseth from the articulation of the Head with the first *Vertebra*, and closeth the *Larynx*.

How many Muscles are there in the Neck, and which be they?

There are four Muscles in the Neck on each side, viz. two Flexors, and two Extensors. The Flexors are the *Scalenus* and the *Rectus* or *Longus*; and the Extenders are the *Spinatus* and the *Transversalis*.

The *Scalenus* or *Triangularis* hath two remote Origins, viz. one from the first Rib, and the other from the Clavicle, and is fasten'd to the third and fourth *Vertebra* of the Neck.

The *Rectus* or *Longus* begins in the side of the four upper *Vertebra's* of the Back, and is join'd to the upper *Vertebra's* of the Neck, and the hinder part of the Head.

The *Spinatus* hath its Origine from the fourth and fifth upper *Vertebra's* of the Back, and is fasten'd to all the lower *Vertebra's* of the Neck.

The *Transversalis* springs forth out of the upper *Vertebra* of the Back, and cleaves to the Extremity of the four *Vertebra's* of the Neck.

C H A P. VIII.

A Parallel between the Diseases of the Bones and the Fleſhy Parts.

IT is no great wonder to ſee the Bones ſubject to the ſame Diſeaſes with the Fleſh and ſoft Parts, ſince they only differ in their Solidity. The Bones are compoſed of Fibres, Veins, Arteries, Tendons and Membranes, as well as the Fleſh.

If the Bones of new-born Animals are broken, Blood will iſſue out, which proves they have Blood-Veſſels. In Adult Perſons too there are ſeveral ſmall Holes through which the Arteries and Veins paſs which penetrate the Interior part of the Bone, into which the little Arteries filtrate the moſt ſoft and Baſſamick Parts of the Blood, which is called Marrow; and this is carried back by the Veins into the Bones to make them ſupple, pliant, and leſs brittle, and into the Maſs of Blood, to ſtreath the Acids, and ſweeten it.

The Tendons of the Muſcles are faſtned not only to the Bones, but are farther inſerted into their inmoſt Parts, and may be ſaid only to be a Continuity of them, ſince the Proceſſes to which they are faſtned, are ſoft and Tendinous in Abortions, and require time to harden into Bone.

The Bones of all Abortive Animals are ſoft like Skins, and are Fibrous and Membranous. Some Years ſince a Woman died in the *Hotel-Dieu* whoſe

whose Bones, which are still kept by *M. Saurard*, Master Surgeon of *Paris*, are exceeding soft. While she was living they were so limber they might be bent any ways. These Instances shew, that Fibres and Membranes enter into the Composition of Bones.

It is no longer a Wonder then, that Bones should be subject to the same Diseases as Flesh, since both are composed of the same Parts.

The fleshy Parts are subject to a Mortification, become Livid, Yellow, turn Black by degrees, and the Parts separate.

This is remedied by applying Compresses dipt in some Spirituous Liquor, to recal Heat and Spirits into the Parts which begin to mortifie, having first scarified the place that they may pierce deeper.

The Bones are subject to a *Caries*. This Disease is a true Gangrene. Consider how they become yellow, blacken by degrees, are full of small Holes, as if Worm-eaten; which Malady is more difficult to cure, the more inveterate it is.

All these Accidents are in a Gangrene; and the Cure of both is the same: That is, by applying Pledgits dipt in Brandy, Spirit of Wine, Oyl of *Guaiacum*, Oyl of Cloves, and rasping the Bone, that these Spirituous Remedies may the better insinuate themselves.

The fleshy Parts are subject to a *Sphacelus*, or a compleat Mortification. They are black, rotten, emit a *Sanies*, and send forth a Cadaverous Stench. This fierce Disease admits no other Remedy but the Knife and actual Cautery. You must remove the Flesh, and after make an Amputation of the Part.

The

The Bones are Sphacelated likewise, become black on the inside, and there comes away a stinking *Sanies*; they only are treated with the Knife and Fire: If this will not do, the Limb must be taken off.

The fleshy Parts are subject to Ulcers, that is, to Tumours which have a stinking *Sanies* flowing from them.

The same Disease happens to the Bones. Those who have rotten Teeth are too well convinced of the Truth of this from the insupportable Stench and ill Taste in their Mouths.

The fleshy Parts are attacked with *Cancers*.

The Bones are also subject to this fierce Disease. I shall mention one Instance taken out of the *Miscellanea curiosa*. There came forth a large black Tooth on the left side of the Mouth in a Child of a Year old, whose Habit of Body was meager, and Skin something discoloured. The Parents, though surpriz'd at first, yet finding the Child suffered no inconvenience, though it continued so for a whole Twelvemonth, neglected to shew it. But perceiving that all the other Teeth which came out were black, they call'd in a Surgeon, who not understanding the Nature of the Distemper, scarified the Swelling on the Gum, which ulcerated the Gum and whole Cheek. This obliged the Relations to call in a Physician, who found this Swelling was Cancerous, and had been irritated by the Sharpness of the Remedies which had made a foul stinking Ulcer, horrible to behold. The Physician prescribed a cooling and moist Diet upon account of the Hective Fever, and order'd some Lotions for the Mouth. This Cancer extended quite to the Temporal Muscle,

and Convulsions ensued, which killed the Child. This *Cancer*, which had its Root in one Tooth only, extended it self pretty far without doing any Damage to the other Teeth. The Bones then are subject to *Cancers* as well as the Flesh.

Ruptures are Dislocations of the Intestines, which sometimes happen in one, and at other times in other Parts. For curing them you must reduce the Parts into their natural Place, and keep them in it by Bandages.

The Bones are subject to the same Diseases; their Displacing or Luxation happen sometimes to one Part and sometimes to another. For the curing them you must put them into their natural place, and keep them in with Bandages.

Contusions and Bruises happen to the Flesh, and you are sometimes obliged to suppurate these to separate the bruised Flesh from the sound.

When the Bones have received some violent blow their Fibres cling together and start out of their Places, and by this means grow black and carious. For the remedying this you often are obliged to exfoliate and separate the corrupted from the sound Part.

This Exfoliation may be look'd on as Suppuration of the Bones.

The fleshy Parts are glewed together as the Fingers and other Parts after great Burns.

And this is often too true, that Bones do the same, as happens in *Anchyloses*, when a Limb is left too long in the same Posture without bending or Extension.

Fleshy Parts are seized with *Erysipela's*, that is, superficial Swellings, which are produced by a subtil and volatil Acid, which makes a Feverish Efflu-

Effervescence with the Volatil Salt of the Mass of Blood, and extends a pretty way over the Skin, where it coagulates the Blood in the external Vessels and disposes it to a Stagnation.

To cure these Swellings, the proper Remedies are Diaphoreticks, Volatile Spirits of Heartshorn, Diaphoretick Antimony, using outwardly the Decoction of Myrrh, Male Frankincense, made in Wine with a little Camphire, Spirit of Wine alone, or with a little Camphire of Saffron to foment the *Erysipelas*, and other Resolvents.

Exostoses in Bones are of a like Nature. There are Bones distended and swoln by the lodging of Humours, which filter through the Channels of the Bones, and insinuate themselves into their Substance. For the curing these Diseases, the most proper internal Remedies are Diaphoreticks and Volatil Spirits, and the most proper external ones are Resolvents.

The fleshy Parts have Abscesses and Tumours, and

The Bones are subject to Swellings, as we see in the Rickets.

The fleshy Parts are divided and broken by Falls and Blows. To cure these it is necessary to reunite the Lips of the Wounds by binding them up; or promote the Generation of new Flesh if there be a loss of Substance.

It happens but too often that the Bones are broken: And then the Ends must be brought together; and that they may agglutinate, must be kept in this Posture; and if there be a loss of Substance, there must be time allowed for the Bone to grow and fill up the Interstices, as happens

pens to Bones of the Head after Trepanning.

When the fleshy Parts have received any blow, the Lips of the Wound recede so far from one another, that it is difficult to bring them together.

The Bones too sometimes suffer Divulsions, as the *Tibia* from the *Perone*, and the *Cubit* from the *Radius*.

The fleshy Parts sometimes sink down, and often the Nipple falls so deep into the Breast, that it hinders the Woman from giving suck.

The Bones are deprest likewise, which happens to those whose Bones continue tender and soft, which often have Depressions without breaking. I shall mention some Examples of this out of *Fabricius Hildanus*.

He tells us, *Cent* 3. *Obs.* 12. that he had seen an Infant of ten Years old who had a great Depression on the Occipital Bone by a Fall. There arising no dangerous Accidents, the Parents neglected to have care taken of the Wound. The Child by Degrees lost both its Memory and Judgment. Though before its Fall it had a deal of Wit, it could not after follow its Studies, or learn any Trade; and at 36 Years of Age became entirely stupid.

The same Author relates farther, that a Child of three Years of Age fell on its Forehead, and made a Depression of the Bone, large enough to put the end of the little Finger into. All the Remedy used, was a Compress dipt in Spirit of Wine and laid on the Wound; which was renewed every Day: The Infant was cured, and suffered no Inconvenience. These Examples shew us, that

that Bones suffer a Depression as well as Flesh: And farther they evince, that all the Functions of the Soul are not perform'd in all parts of the Brain, since the former became wholly incapable of all Learning, nay wholly stupid, while the other suffer'd no remarkable Accident.

The fleshy Parts lessen their Bulk, and the Body grows lean.

The Bones grow lean too, and are much less'n'd. I shall give you a surprizing Instance. A certain Person having a continued Pox, his Bones became so weak and slender that he broke his Arm by lifting a five or six Pound Weight. When we examine the Bones of such as have died of the Pox, we find them all corroded within, and extremely slender. These Examples shew us that the Bones waste as well as the Flesh.

Let any Man, if he pleases, examine all the Diseases which happen to the fleshy Parts, and he will find they happen to the Bones likewise, and are to be treated in the same manner.

This is most of what I could gather from the learned Parallel of the Diseases of the fleshy Parts, and the Bones made by the famous M. Arnaud in the stately Amphitheater of St. Cosmus, but which no more represents the Discourse of that skilful Operator, than Shadows do Sun-shine, or Copies an Original.

CHAP. IX.

Of the Myology or Anatomy of the Muscles of the Trunk ; or of the Breast, Belly, and Back.

HOW many Muscles are there in the Breast, and which be they ?

The Breast hath fifty seven Muscles, that is to say, thirty that serve to dilate it, twenty six whose Office is to contract it, and the *Diaphragm* or *Midriff*, which partakes of both Actions.

The thirty which dilate the Breast are equally plac'd on both sides to the number of fifteen on each, viz. the *Subclavius*, the *Serratus Major Anticus*, the two *Serrati Pectici*, and the eleven external *Intercostals*.

The twenty six which contract the Breast are likewise equally rank'd to the Number of thirteen on each side ; viz. the *Triangulares*, the *Sacrolumbus*, and eleven internal *Intercostals*.

The *Subclavian* takes up the whole space between the *Clavicle* and the first Rib : Its Original being from the internal and lower part of the *Clavicula*, and its insertion in the upper part of the first Rib.

The *Serratus Major* is a large Muscle, having seven or eight Indentings or Jaggs. It makes its rise from the interior Basis of the *Scapula* or Shoulder-blade, and its Jaggings are inserted in the

the five lower true Ribs, as also in the two upper spurious Ribs.

The *Serratus Posticus Superior*, begins with a large *Aponeurosis* in the Processes of the three lower *Vertebrae* of the Neck, and of the first of those of the Back; then passing under the *Rhomboid*, it is join'd obliquely by four Indentings to the four upper Ribs.

The *Serratus Posticus Inferior*, commenceth in like manner with a large *Aponeurosis* from the Processes of the three lower *Vertebrae* of the Back, and of the first of those of the Loins, and is afterwards fasten'd by four Digitations to the four lower Ribs.

The eleven *External Intercostal Muscles* are situated in the spaces between the twelve Ribs, passing obliquely and on the outside from the back part to the fore part. They take their rise below the Upper Rib, and have their Insertion above the lower Rib.

The *Triangularis* is the first of those that contract the Breast, and possesseth the inward part of the *Sternum*: Its Original is from its lower part, and its Insertion in the top of the Cartilages of the two upper Ribs.

The *Sacrospinalis* hath its Rise in the hinder part of the *Os Sacrum*, as also from the *Vertebrae* of the Loins, and ascending from thence, insinuates it self into the hinder part of the Ribs, to every one of which it imparts two Tendons, one whereof adheres on the outside, and the other on the inside. This Muscle is fleshy within, and fibrous without.

The eleven *Internal Intercostals*, contrary to the *External*, derive their Original from the
top

top of every lower Rib, and ascend obliquely from the back-part to the fore-part, till they are join'd to the lower Edge of every upper Rib: Thus these Internal Muscles, with the External, form, by the opposition of their Fibres, a Figure resembling a St. Andrew's Cross.

The Diaphragm or Midriff is esteem'd as the fifty seventh Muscle of the Breast, and serves as well for its dilatation as contraction. It separates the *Thorax* or Chest from the lower Belly, and is tied circularly to all the Extremities of the Bastard Ribs, immediately under the *Xiphoides*, or Sword-like Cartilage.

Modern Anatomists have discover'd that the Diaphragm is compos'd of two Muscles, viz. one Upper, and the other Lower; so that the Upper cleaves to the Extremities of the Spurious Ribs, and is terminated in a flat Tendon in the middle, which hath been always taken for its Nervous part. The Lower begins with two Productions, the longest whereof being on the Right side, ariseth from the three upper *Vertebrae* of the Loins, and the other on the Left from the two *Vertebrae* of the Back, till it is lost in the *Aponeurosis* of the Upper Muscle.

How many Muscles are there in the Back and the Loins; and which be they?

There are three in each side, viz. one for Flexion, and the other for Extension.

The *Triangularis* is the *Flexor*, taking its rise in the hinder part of the Rib of the *Os Ilion*, and the inner part of the *Os Sacrum*, in passing from whence it is joined to the last of the Bastard

stard

stand Ribs, and to the transverse Productions of the *Vertebra* of the Loins.

The *Extensors* are the *Sacer*, and the *Semi-spinatus*, which make the Waste streight, and are so interwoven along the Back-bone, that one would imagine that there were as many Pairs of Muscles as *Vertebra*'s, affording *Tendons* to all.

The *Sacer* springs from behind the *Os Sacrum*, as also from the hinder and upper Extremity of the *Os Ilium*, and is inserted in the Spines of the *Vertebra*'s of the Loins and Back.

The *Semi-spinatus* hath its Rise from the Spines of the *Os Sacrum*, and is join'd to all the transverse Productions of the *Vertebra*'s from the Back to the Neck, being exactly situated between the *Sacer* and the *Sacrolumbus*.

CHAP. X.

Of the Myology, or Anatomy of the Muscles of the lower Belly.

HOW many Muscles are there in the lower Belly, and which be they?

There are generally ten, five on each side, that is to say, two *Obliqui*, one ascending, and the other descending; one *Transversus*, one *Rectus*, and two *Pyramidal*, of which last, nevertheless there is sometimes only one, and sometimes none at all.

The

The *Obliquus Descendens*, which is the first, hath its Original by digitation from the sixth and seventh of the true Ribs, from all the spurious Ribs, and the transverse Processes of the *Vertebrae* of the Loins, and comes near to the *Serratus Major Anticus* of the Breast; from whence it proceeds to the external Ridge of the *Os Ilion*, and is terminated by a large *Aponeurosis* in the *Linea Alba* or *White Line*, which separates the Muscles that are on each side of the *Abdomen* of lower Belly.

The *Obliquus Ascendens* ariseth from the upper part of the *Os Pubis*, and the Ridge of the Hip Bone or *Ilion*; till it cleaves to the Processes of the *Vertebrae* of the Loins, the Extremities of all the Ribs, and from the *Xiphoides* or Sword-like Cartilage, and is terminated in the White Line by a large *Aponeurosis*.

The *Rectus* being situated between the *Aponeurosis* of the *Obliquus*, takes its rise from the Cartilages of the Ribs, the *Xiphoides* and the *Sternum*, and enters into the *Os Pubis*, having many nervous Parts to corroborate it in its length.

The *Transversus* having its beginning in the transverse *Apophyses* of the *Vertebrae* of the Loins, is fasten'd to the internal Rib of the *Os Ilion*, and within the Cartilages of the lower Ribs, and is terminated by a large *Aponeurosis* in the *Linea Alba*, passing over the *Rectus*, and sticking to the *Peritonium*.

The *Oblique Muscles*, and the *Transverse*, have Holes toward the Groin, to give Passage to the *Spermatick Vessels* of Men, and to the round Ligament

Ligament of the Womb in Women; here it is that Ruptures or Burstness happen in both Sexes, although the Holes of these three Muscles are not situated one over-against another.

The Pyramidal, so named by reason of its Figure, is situated in the lower Tendon of the *Rectus*, its Origine being in the upper and external part of the *Os Pubis*; but it is terminated in the White Line, three Fingers breadth above the *Pubes*, and sometimes even in the Navel it self. These Muscles are not found in all Bodies, for there are somerimes two, sometimes only one, and sometimes none.

The use of the Muscles of the lower Belly is to compress all the contain'd parts, in order to assist them in expelling the Excrements.

How many Muscles are there in the Testicles?

They have each of them one, call'd *Cremaster*; This Muscle takes its rise from the Ligaments of the *Os Pubis*, and by the dilatation of its Tendon covers the Testicle, which it draws upward.

How many Muscles hath the Penis?

It hath two Pair, viz. the *Erectores* or *Director*, and the *Dilatantes*: The *Erectores* arise from the internal part of the *Os Ischion*, under the beginning of the *Corpora Cavernosa*, where they are inserted, and retake their Fibres in their Membranes. The *Dilatantes* or *Acceleratores* have their Source in the *Sphincter* of the *Anus*, and slipping from thence obliquely under the *Ureter*, are join'd to the Membrane of the Nervous Bodies.

How many Muscles are there in the Clitoris?

It hath two Erectors which spring forth from
the

the Protuberance of the *Os Ischion*, and are inserted in the Nervous Bodies of the *Clitoris*. There are also two others suppos'd to be its Elevators, which proceed from the *Sphincter* of the *Anus*, and are terminated in the *Clitoris*.

How many Muscles are there in the Anus?

There are three, viz. the *Sphincter*, and two *Levatores*. The *Sphincter* is two Fingers broad, to open and close the *Rectum*. This Muscle being double, is fasten'd in the fore-part to the *Penis* in Men, and to the Neck of the Womb in Women, as also behind to the *Coccyx*, and laterally to the Ligaments of the *Os Sacrum*, and the Hips.

The two *Levatores* arise from the inner and lateral part of the *Os Ischion*, and are fasten'd to the *Sphincter* of the *Anus*, to lift it up after the expulsion of the Excrements.

The *Bladder* hath also a *Sphincter* Muscle to open and shut its Orifice.

C H A P. XI.

Of the Muscles of the Scapulæ, or Shoulder-Blades, Arms, and Hands.

HO *W many ways doth the Scapula or Shoulder-Blade move, and what are its Muscles?*

The *Scapula* moves upward, downward, forward, and backward, by the means of four proper Muscles, which are the *Trapezius*, the *Rhom-*

Rhomboides, the proper *Levator*, and the lesser *Pectoral*, or *Serratus Minor Anticus*.

The *Trapezius* or *Cucullaris* hath its beginning from the back part of the *Occiput*, or hinder part of the Head, from the Spines of the six lower *Vertebra's* of the Neck, and of the nine upper of the Back in passing from whence it is implanted in the Spine of the Processes or Shoulder-Blade, and the external part of the *Clavicula*, as far as the *Acromion*. This Muscle produceth many Motions by reason of its different Fibres, drawing the Shoulder-Blade obliquely upward, downward, and forward.

The *Rhomboides* is situated over the *Trapezius*, its rise being in the Processes of the three lower *Vertebrae* of the Neck, and of the three upper of the Back, but it is afterward join'd to the whole *Basis* or Root of the *Scapula*, which it draws backward.

The proper *Levator* commenceth in the *Transverse* Processes of the four first *Vertebrae* of the Neck, by different Progressions, but is afterward re-united, and inserted in the upper corner of the *Scapula*, which it draws upward.

The lesser *Pectoral*, or *Serratus Minor Anticus*, is situated under the great *Pectoral*, its rise being by Digitation or Indenting in the second, third, and fourth of the upper Ribs, and its Insertion in the *Processus Coracoideus* of the Shoulder-Blade, which it draws forward.

How many Motions are there in the Humerus, or Arm, which be they, and what are its Muscles?

The

The Arm performs all sorts of Motions by the help of nine Muscles: For it is lifted up by the *Deltoides* and the *Infra-Spinatus*; it is depress'd by the *Largissimus*, and the *Rotundus Major*; it is drawn forward by the *Pectoralis Major*, and the *Coracoideus*; it is drawn backward by the *Infra-Spinatus*, and the *Rotundus Minor*: It is drawn near to the Ribs by the *Sub-scapularis*, and its circular Motion is performed when all these Muscles act together successively.

The *Deltoides* or *Triangular* hath its beginning from the whole Spine of the *Scapula*, the *Acromion*, and half the *Scapula*, and by its point cleaves with a strong *Tendon* to the middle of the Arm.

The *Infra-Spinatus* takes its rise in the Cavity that lies above the Spine of the *Scapula*, which it fills, passing over the *Acromion*, until it is join'd to the Neck of the Shoulder-Bone, which it surrounds with a large *Tendon*.

The *Largissimus*, otherwise call'd *Ani-Scalptor*, covers almost the whole Back, proceeding from a large and Nervous Stock, in the Third and fourth lower *Vertebra* of the Back, the five *Vertebra's* of the Loins, the Spine of the *Os Sacrum*, the hinder part of the Ridge of the *Os Ilion*, and the external part of the lower Bastard-Ribs, in passing from whence it insinuates it self into the lower corner of the *Scapula*, as also into the upper and inner part of the *Humerus*.

The *Rotundus Major*, or *Teres Major*, having its Origin from the external Cavity of the lower corner of the *Scapula*, is confounded with the *Largissimus*, and adheres with it by the same
Tendon

Tendon to the upper and inner part of the *Humerus*, a little below the Head.

The greater *Pectoral* hath its Source from half the *Clavicula*, on the side of the *Sternum*; covers the fore-part of the Breast, and is fasten'd by a short, broad, and nervous *Tendon*, to the top of the Shoulder-Bone, on the inside, between the *Biceps* and the *Deltoides*.

The *Coracoideus* or *Coracobrachicus*, beginning from the *Processus Coracoideus* of the *Scapula* or Shoulder-Blade, adheres to the middle of the Arm on the inside, which with the *Pectoral* it draws forward.

The *Infra-Spinatus* fills the Cavity which lies below the Spine of the *Scapula*, its Origine being from the lower side of the *Scapula*, from whence it passeth between the Spine and the *Rotundus Minor*, to cleave to the Neck of the Shoulder-Bone, which it embraceth, and draws backward.

The *Rotundus Minor*, or *Teres Minor*, proceeds from the lower side of the *Scapula*, and adheres to the Neck of the Shoulder-Bone with the *Infra-Spinatus* to draw it in like manner backward.

The *Sub-scapularis* or *Immersus* is situated entirely under the *Scapula*, proceeding from the internal side of the *Basis* or Root of the same, and being terminated in the Neck of the Arm-Bone, which it causeth to lie close to the Ribs.

How many Motions are there in the Cubitus or lower Arm, and what are its Muscles?

The *Cubitus* or *Ulna* is endued with two sorts of Motions, viz. that of Flexion and that of Ex-

Extension, the former being perform'd by the help of two Muscles, that is to say, the *Biceps*, and the *Brachius Internus*; and the later by eight others, which are the *Longus*, the *Brevis*, the *Brachius Externus*, and the *Anconius*.

The *Biceps* is a Muscle with two Heads, one whereof proceeds from the *Processus Coracoides*, and the other from the Cartilaginous edge of the *Glenoid Cavity* of the Shoulder-Blade: These two Heads descend along the fore-part of the Arm, and are united in one and the same Body, from whence springs forth a Ligament, which is inserted in a tuberosity situated in the upper and fore-part of the *Radius*.

The *Brachius Internus* is a small fleshy Muscle, lying hid under the *Biceps*, which takes its rise from the upper and fore-part of the *Humerus*, and is implanted in the upper and inner-part of the *Radius*, to bend the Elbow with the *Biceps*.

The first of the four Extenders is the *Longus* having two Origins, viz. one from the corner side of the *Scapula* near its Neck, and the other descending to the hinder-part of the Arm, till it is tied to the *Olecranon* or *Ancon*, by a strong *Aponeurosis*, which is common thereto, with the *Brevis*, and the *Brachius Externus*.

The *Brevis* or short Muscle of the Cubit arising from the hinder and upper-part of the *Humerus*, is fasten'd to the *Olecranon* with the *Longus*.

The *Brachius Externus* is a fleshy Muscle which proceeds from the hinder part of the *Humerus*, and adheres to the *Olecranon* with the *Brevis* and the *Longus*.

The

The *Anconeus* or *Cubitalis* being situated behind the Fold of the *Cubitus*, is the least Muscle of all; it springs from the Extremity of the Arm-Bone, at the end of the *Brevis* and the *Longus*, and in descending is inserted between the *Radius* and the *Cubitus* or *Ulna*, three or four Fingers breadth below the *Olecranon*.

How many Muscles bath the *Radius*, and what are its Motions?

The *Radius* is endu'd with a twofold Motion, by the means of four Muscles: Of these the *Rotundus* and *Quadratus* cause that of *Pronation*, as the *Longus* and the *Brevis* that of *Supination*.

The *Pronator Superior Rotundus*, or round Muscle of the *Radius*, commenceth from the inner Process of the Shoulder-Bone, in a very fleshy Stock, and is terminated obliquely by a Membranous Tendon in the middle and exterior part of the *Radius*.

The *Pronator Inferior Quadratus*, springing forth from the bottom and inside of the *Cubitus*, is fixt in the lower and outward part of the *Radius* by a Tail as large as its Head. This Muscle lying hid under the others near the Wrist, is that which jointly with the *Rotundus*, turns the Arm with the Palm of the Hand downward; which is the Motion of *Pronation*.

The *Longus* is the first of the *Supinators*, whose Origine is three or four Fingers breadth above the external Process of the Arm-Bone; from whence it passeth along the *Radius*, and cleaves to the inner part of its lower Process.

The *Brevis*, or the second of the *Spinators* rising from the lower part of the *Inferior Condylus*.

lus, and the external of the *Humerus*, is twisted round about the *Radius*, going forward from the hinder part till it is united to its upper and fore part. This Muscle, with the *Longus*, serves to turn the Arm and the Palm of the Hand upward, and produceth the Motion of *Supination*.

How many sorts of Motions belong to the Wrist, and what are its Muscles?

Two several Motions are perform'd by the Wrist, *viz.* one of Flexion, and the other of Extension, three Muscles being appropriated to the former, and as many to the later: But it ought to be observed, that a strong Ligament, call'd the *Annular*, appears here, which surrounding all the *Tendons* of the Muscles as it were a Bracelet, holds them together, and elsewhere serves to unite the two Bones of the Cubit. The three Flexors or Bending Muscles of the Wrist are the *Cubiteus Internus*, the *Radieus Internus*, and the *Palmaris*.

The *Cubiteus Internus* derives its Original from the part of the Arm Bone, passeth under the Annular Ligament, and is ty'd by a thick Tendon to the small Bone of the Wrist, which is plac'd above the others.

The *Radieus Internus* proceeds from the same place with the *Cubiteus*, and is fasten'd to the first Wrist Bone which supports the Thumb. It lies along the *Radius*, and passeth under the *Annular* Ligament.

The *Palmaris* is reckon'd among the Flexors of the Wrist, although situated in the Palm of the Hand. It ariseth from the inner process or Knob of the Arm Bone and is united by a large Tendon to the first *Phalanges* of the Fingers, slipping

ping under the Transverse or *Annular* Ligament, and cleaving under the Skin of the Palm of the Hand.

The three extending Muscles of the Wrist are the *Cubitus Externus*, and the *Radius Externus* or the *Longus*, and the *Brevis*.

The *Cubitus Externus* taking its rise from the hinder part of the Cubit, passeth under the *Annular* Ligament, and adheres to the upper and outward part of the Bone of the *Metacarpus* that stayeth the Little-finger.

The *Radius Externus*, or the *Longus*, having its Origine from the edge of the lower part of the Arm Bone, slides from thence along the *Radius* on the outside; extends it self under the *Annular* Ligament, and cleaves to the Wrist Bone, which stayeth the Fore-finger.

The *Brevis* or short Muscle of the Wrist springs from the lower part of the same Edge; afterward it runs along the *Radius*, passeth under the *Annular* Ligament, and is terminated in the Bone of the *Carpus* or Wrist, which stayeth the middle Finger. But we must take notice, that besides these fix Muscles, there is also *Caro quaedam quadrata*, or a square piece of Flesh under the *Palmaris* which seems to arise from the *Thenar*, and cleaves to the eighth Wrist Bone. It is supposed that this Musculous piece of Flesh serves with the *Hypothenar* of the little Finger, to make that which is call'd *Diogenes's Cup*.

How many Motions are there in the Fingers, and what are their Muscles?

The Fingers are bent, extended, and turn'd from one side to the other by the means of twenty three Muscles, whereof ten are proper, and

thirteen common: The former are those that serve all the Fingers in general, and the other those that are, particularly serviceable to some of them: The common are the *Sublimis*, the *Profundus*, the common *Extensor*, the four *Lumbricales*, and the six *Interossei*.

The *Sublimis* or *Perforatus*, arising from the internal part of the lower Process of the *Humerus* or Shoulder Bone is divided into four *Tendons*, which run below the *Annular Ligament* of the Wrist, and are inserted in the second *Phalanx* of the Bones of the four Fingers, after cleaving as they pass along to those of the first *Phalanx*, to help to bend it. It is also observ'd that every one of these *Tendons* hath a small cleft in its length, to let in the *Tendons* of the *Profundus*.

The *Profundus* or *Perforans* lies under the *Sublimis*, deriving its Original from the top of the *Cubitus* and *Radius*. It creeps along these two Bones, and is divided into four *Tendons*, which pass under the *Annular Ligament*, and slip into the Fissures of the *Tendons* of the *Sublimis*, to adhere to the third *Phalanx* of the Fingers, which they bend with the *Sublimis*: So that these two Muscles make together the bending of the Fingers.

The *Extensor Magnus* is that which extends the four Fingers. It springs from the external and lower Process of the Arm Bone, and is divided into four flat *Tendons*, which pass under the *Annular Ligament*, and cleave to the second and third *Phalanx* of the Fingers.

The

The four *Lumbricales* or *Vermiculares* are in the Palm of the Hand, to draw the Fingers to the Thumb: They proceed from the *Tendons* of the *Profundus*, and the *Annular* Ligament, extend themselves along the sides of the Fingers, and are inserted into their second Articulation, to draw them toward the Thumb.

The three *Interossei Interni*, and the three *Externi*, are situated between the four Bones of the *Metacarpus*, as well on the inside of the Hand as without: They have their beginning in the Intervals or Spaces between the Bones of the *Metacarpus*, are united with the *Lumbrical*, and fixt in the last Articulation of the Bones of the Fingers, to produce the Motion of drawing back or removing from the Thumb.

The Thumb is mov'd by five particular Muscles; one whereof serves to bend it, two to extend it, one to remove it from the Fingers, and another to draw it to them.

The *Flexor* of the Thumb takes its rise from the upper and inner part of the *Radius*, passeth under the *Annular* Ligament, as also under the *Thenar*, and adheres to the first and second Bone of the same Thumb to bend it.

The two *Extensors* of the Thumb are the *Longior* and the *Brevior*: The former proceeding from the upper and outward part of the *Cubitus*, ascends above the *Radius*, and is ty'd with a forked *Tendon* to the second Bone of the Thumb. The *Brevior* hath the same Origine with the *Longior*, keeps the same Track, passeth under the *Annular* Ligament, and is terminated in the third Thumb Bone.

The *Thenar* removes the Thumb from the Fingers, and forms that part which is call'd the *Mount of Venus*: It hath its rise from the first Bone of the *Carpus* or Wrist, and the *Annular* Ligament, and is inserted in its second Bone.

The *Antithenar* draws the Thumb to the other Fingers, having its Origine in the Bone of the *Metacarpus*, that stayeth the middle Finger, and its Motion is in the first Bone of the Thumb.

The Muscle which serves to extend the Fore-finger, is call'd *Indicator*: It proceeds from the middle and outer part of the *Cubitus*, and is fixt by a double *Tendon* in the second Articulation of the Fore-finger, as also in the *Tendon* of the great *Extensor* of the Fingers.

That which draws the Fore-finger to the Thumb is term'd *Adductor*: It commenceth in the fore part of the first Thumb Bone, and is terminated in the Bones of the Fore-finger.

That which removes the Fore-finger from the Thumb is known by the Name of *Abductor*, which arising out of the external and middle part of the Bone of the Cubit, and passing under the *Annular* Ligament, cleaves to the Lateral and outward part of the Bones of the Fore-finger.

The Little-finger hath two proper Muscles, *viz.* an *Extensor* and an *Abductor*.

The *Extensor* springs from the lower part of the *Condylus* of the Arm Bone, and is fasten'd by a double *Tendon* in the second Articulation of the Little-finger, and in the *Tendon* of the *Extensor* of all the others.

The

The *Abductor*, call'd also *Hypothenar*, hath its beginning from the small Bone of the Wrist, which is situated over the others, and is terminated in the first Bone of the Little-finger on the outside.

C H A P. XII.

Of the Muscles of the Thighs, Legs, and Feet.

What are the Motions of the Thighs?

The Thigh performs five kinds of Motions; for it is bent, extended, drawn within side and without, and turn'd round: All these Motions are produc'd by the means of fourteen Muscles, viz. three *Flexors*, three *Extensors*, three *Adductors*, three *Abductors*, and two *Obturator*s for the Circular Motion.

The *Flexors* of the Thigh are the *Psoas*, *Iliacus*, and *Pectineus*.

The *Psoas* or *Lumbaris* is situated inwardly in the *Abdomen*, on the side of the *Vertebra's*. It proceeds from the transverse Processes of the two lower *Vertebra* of the Back, and of the upper of the Loins, and lying on the inner Face of the *Os Ilion*, cleaves to the lesser *Trochanter* or *Rotator*.

The *Iliacus Internus* hath its Origine in all the Lips of the inner Cavity of the *Os Ilion*, and being joyn'd by a *Tendon* to the *Lumbaris*, is inserted with it in the lesser *Trochanter*.

The *Pectineus* takes its rise from the fore part of the *Os Pubis*, and is united before to the Thigh Bone a little below the lesser *Trochanter*.

The *Extensors* of the Thigh are the *Gluteus Major*, *Medius*, and *Minimus*.

The *Gluteus Major* springs forth out of the lateral part of the *Os Sacrum*, as also the hinder and outer part of the *Os Ilion* and *Coccyx*, and enters into the Thigh Bone, four Fingers breadth below the great *Trochanter* or *Rotator*, being the thickest of all the Muscles of the Body.

The *Gluteus Medius*, deducing its Original from the hinder and outward part of the *Os Ilion*, is inserted three Fingers breadth below the great *Trochanter*.

The *Gluteus Minimus* ariseth from the bottom of the Cavity of the *Os Ilion*, and is fasten'd to a small Hole near the great *Trochanter*.

The *Adductors* of the Thigh are the *Triceps Superior*, *Medius*, and *Inferior*.

The *Triceps Superior* hath its beginning in the top of the *Os Pubis*, and is terminated in the top of a Line, which is on the inside of the Thigh.

The *Triceps Medius* proceeding from the middle of the *Os Pubis*, is inserted in the Thigh Bone a little lower than the *Triceps Superior*.

The *Triceps Inferior* hath its Source in the bottom of the *Os Pubis*, and is implanted in the Thigh Bone, a little lower than the *Triceps Medius*. Some Anatomists make only one Muscle of these three, attributing thereto three Originals and three Insertions. These Muscles serve to draw the Thighs one against another.

The *Abductors* of the Thigh are the *Iliacus Externus*, or *Pyriformis*, the *Quadratus*, and the *Gemelli*.

The

The *Pyriformis* arising from the upper and lateral part of the *Os Sacrum*, and the *Os Ilion*, cleaves to the Neck of the great *Trochanter*.

The *Quadratus* or square Muscle of the Thigh, takes its Origine from the external Prominence of the *Os Ischion*, and adheres to the outward part of the great *Trochanter*.

The *Gemelli* or Twin Muscles arise from two small Knobs in the hinder part of the *Ischion*, and insinuate themselves into a small Cavity in the Neck of the great *Trochanter*.

The Circular Motion of the Thigh is performed by the means of two Muscles, named the *Obturatores Externi* and *Interni*.

The *Obturator Internus* springs from the inner Circumference of the Oval Hole of the *Ischion*, and its Tendons passing between the two *Gemelli*, are inserted in a small Cavity at the Root of the great *Trochanter* or *Rotator*.

The *Obturator Externus* ariseth from the outward Circumference of the same Hole of the *Ischion*, and is terminated in the side of the other, near the great *Trochanter*.

What are the Motions of the Leg, and what are its Muscles?

The Leg is mov'd four several ways, that is to say, it is bent, extended, and drawn inward and outward, by the means of eleven Muscles viz. three *Flexors*, four *Extensors*, two *Adductors*, and two *Abductors*.

The three *Flexors* of the Leg are the *Biceps*, the *Semi-nervosus*, and the *Semi-membranosus*.

The *Biceps* hath two Heads, the longer whereof cometh out of the bottom of the Prominence

of the *Iſchion*, and the other from the middle and exterior part of the *Femur*, and is terminated in the outward and upper part of the *Epiphyſis* of the *Perone* or *Fibula*.

The *Semi-nervosus* hath its Origine in the Knob of the *Iſchion*, and is join'd backward to the top of the *Epiphyſis* of the *Tibia*. These three Muscles are plac'd in the back part of the Thigh below the Buttocks.

The four *Extensors* of the Leg are the *Rectus*, the *Vastus Internus*, the *Vastus Externus*, and the *Crureus*.

The *Rectus* or ſtreight Muscle of the Leg takes its riſe from the fore part and the bottom of the *Ilium*, and deſcends in a right Line: It covers with its *Tendon*, which is common to the three following, the whole Knee Pan, and adheres to the top of the *Tibia*, on the fore part.

The *Vastus Internus*, being ſituated on the inſide of the Thigh, hath its beginning in the top of the Thigh inwardly, and a little below the leſſer *Trochanter* or *Rotator*: Afterward it is ry'd to the *Tibia* by a large *Tendon*, common thereto with the preceeding.

The *Vastus Externus* is plac'd on the outſide of the Thigh, ſpringing from the top and the fore part of the *Femur*, being united by the ſame *Tendon* with the two preceeding.

The *Crureus* proceeds from the top, and the fore part of the Thigh Bone, between the two *Trochanters*; then covering the whole Bone, it is alſo faſten'd to the Leg Bone with the three preceeding Muscles, after having cover'd the Knee Pan with their common *Tendon*.

don; which serves likewise as a Ligament to the Knee.

The two *Adductors* of the Leg are the *Sartorius* and the *Gracilis*.

The *Sartorius* or the *Longissimus* draws the Leg inward, deriving its Original from the upper Spine of the *Iſchion*; from whence it descends obliquely thro' the inside of the Thigh, and cleaves to the top on the inside of the *Tibia*.

The *Gracilis* hath its Origine in the fore part at the bottom of the *Os Pubis*, and its Insertion in the top of the *Tibia* on the inside.

The two *Abductors* of the Leg are the *Fascia lata*, and the *Popliteus*.

The *Fascia lata*, or the *Membranosus*, is as it were a kind of large Band, which covers all the Muscles of the Thigh. It proceeds from the outward edge of the *Os Ilium*, is ty'd by a large Membrane to the top of the *Perone* or *Fibula*, and sometimes descends to the end of the Foot.

The *Popliteus*, or *Sub-popliteus*, arising from the lower and external *Condylus* of the Thigh Bone, passeth obliquely from the outside to the inside, till it is lost in the upper and inner part of the Leg Bone under the Ham.

What are the Motions of the Foot, and what are its Muscles?

The Foot performs two Motions by the help of nine Muscles, as being bent by two, and extended by seven.

The two *Flexors* are the *Tibieus Anticus*, and the *Peroneus Anticus*.

The *Tibieus Anticus*, is plac'd along the *Tibia*, and takes its rise from its upper and fore part: Afterward it is bound by two *Tendons* to the first

Os Cuneiforme, or Wedge-like Bone, and to that of the *Metatarsus* or Instep, which stayeth the great Toe, after having pass'd under the Annular Ligament.

The *Peroneus Anticus* springs from the middle and outward part of the *Perone* or *Fibula*, and insinuating it self thro' the Cleft which is under the external *Malleolus* before, cleaves to the Bone of the *Metatarsus* that supports the little Toe.

The Seven *Extensors* of the Foot are the two *Gemelli*, or the *Soleus*, the *Plantaris*, the *Tibialis Posticus*, and the two *Peronai Postici*.

The *Gemelli* are the *Interior* and the *Exterior*; the former having its Rise from the inner *Condylus*, and the other from the outward and lower of the Thigh Bone; whence they extend themselves till they are fasten'd to the *Talus* or Ankle Bone by a *Tendon* common to them, with the two following.

The *Soleus* arising from the top on the back part of the Leg Bone and *Perone*, and confounding its *Tendon* with that of the *Gemelli*, cleaves close to the *Talus*.

The *Plantaris*, which lies hid between the *Gemelli* and the *Soleus*, hath its Origine from the *Exterior Condylus* of the Thigh Bone; then uniting its *Tendon* with the preceeding, it adheres to them, and this common *Tendon* is call'd *Chorda Achillis*.

The *Tibialis Posticus*, springs from the back part of the Leg Bone, from whence extending it self downward, it passeth thro' the Fissure in the *Internal Malleolus*, and cleaves to the inner part of the *Os Scaphoides*.

The

The *Peronæi*, or *Fibulæi Postici*, are otherwise call'd the *Longus* and the *Brevis*, whereof one proceeds from the upper, and almost fore part of the *Perone*, terminating in the upper part of the Bone that supports the great Toe in the *Metatarsus*, and the other from the lower part of the *Perone*, adhering in like manner to the Bone with which the little Toe is sustain'd.

With what Motions are the Toes endu'd, how many Muscles have they, and which be they?

The Toes are bent and extended, as also drawn inward and outward, by the means of twenty two Muscles, of which sixteen are Common, and six Proper. The former are two *Flexors*, two *Extensors*, four *Lumbricales*, and eight *Interossei*. The first *Flexor* is nam'd *Sublimis*, and the other *Profundus*.

The *Sublimis* or *Perforatus* derives its Original from the lower and inner part of the *Talus*, and is fixt in its proper place by four cleft *Tendons*, which are inserted in the upper part of the Bones of the first *Phalanx* of the four Toes. It is situated under the Sole of the Feet.

The *Profundus* or *Perforans* hath its beginning in the top and back part of the Leg-bone and *Perone*, slips under the *Malleolus Internus* through the *Sinus Calcari*, and makes four *Tendons*, which pass through the Fissures of the Tendon of the *Sublimis*, and cleaves to the Bones of the last *Phalanx* of the Toes to bow them.

The first *Extensor* is call'd the *Common*, and the other the *Pedieus*.

The *Common Extensor*, or the *Longus*, takes its rise from the top and fore-part of the *Tibia*, in the place of its joyning with the *Perone* or *Fibula*,

Fibula, and divides it self into four *Tendons* which after having pass'd under the Annular Ligament, are inserted in the Articulations of every Toe.

The *Pedius* or the *Brevis*, being plac'd over the Foot, proceeds from the Annular Ligament, and the lower part of the *Perone*, and sends forth four *Tendons*, which are fixt to the first Articulation of the four Toes on the outside. Thus this Muscle, together with the *Longus*, causeth their Extension.

The four *Lumbrical* Muscles of the Toes arise from the *Tendons* of the *Profundus*, and a Mass of Flesh at the Sole of the Feet. They are joyn'd by their *Tendons* with those of the *Interossei Interni*, and adhere inwardly to the side of the first Bones of the four Toes, to incline them toward the great Toe.

The *Abductors*, or those Muscles that remove the Toes from the great Toe, are the eight *Interossei*, whereof four are called *Externi*, and as many *Interni*. The former take their rise in the Spaces between the Bones of the *Metatarsus*, and are terminated outwardly in the side of the first Bones of the Toes. The Internal lie in the bottom of the Foot, and take up the Spaces between the five Bones of the *Metatarsus*. They arise from the Bones of the *Tarsus*, and the Intervals between those of the *Metatarsus*, and are implanted with the four *Lumbricales* inwardly, in the upper part of the Bones of the first *Phalanx* of the four Toes.

Of the six Proper Muscles of the Toes, there are four appointed for the great Toe, which cause it to perform the Motions of Flexion, Extension,

tension, and draw it forward or backward. The two others are the *Adductor* of the second Toe to the great Toe, and the *Abductor* of the little Toe, call'd *Hypothenar*.

The Proper *Flexor* of the great Toe, arising from the top of the *Perone* or *Fibula*, on the back part, passeth through the Ankle-bone on the inside, to the Sole of the Foot, and is fasten'd to the Bone of the last *Phalanx*.

The Proper *Extensor* of the great Toe springs from the middle of the fore part of the *Perone*, passeth over the Foot, and hath its Insertion in the upper part of the Bone of the great Toe.

The Proper *Adductor* of the great Toe, or the *Thenar*, taking its rise inwardly on the side of the *Talus*, the *Ossa Scaphoidea* and *Innominata*, extends it self over the outward part of the Bone of the *Metatarsus*, which stayeth the great Toe, and adheres to the top of the second Bone of the great Toe, which it draws inward.

The Proper *Abductor* of the great Toe, or the *Antithenar*, draws it toward the other Toes. It derives its Origin from the Bone of the *Metatarsus*, which supports the little Toe, slides obliquely over the other Bones, and cleaves to the first Bone of the great Toe on the inside.

The *Adductor* appropriated to the second Toe hath its Rise from the first Bone of the great Toe, on the inside, and sticks close to the Bones of the second Toe, which it draws to the great Toe.

The

The *Abductor* of the little Toe, or the *Hypothenar*, proceeds from the outward part of the Bone of the *Metatarsus*, that stayeth the little Toe, and is inserted in the top of the little Toe, on the outside, to remove it from the others.

A List of all the Muscles in the Humane Body;

The Forehead hath two Muscles

The hinder part of the Head

The Eye-lids

The Eyes

The Nose

The Ears on the outside

The Ears on the inside

The Lips

The Tongue

The Uvula

The Larynx

The Pharynx

The Os Hyoides

The Lower Jaw

The Head

The Neck

The Scapula or Shoulder-blades

The Arms

The Cubits

The Radii

The Wrists

The Fingers

The Breast, or the Parts of Respiration

The Loins

The Abdomen or lower Belly

The Testicles

The Bladder

The

The Penis	4
The Clitoris	4
The Anus	3
The Thighs	30
The Legs	22
The Feet	18
The Toes	44
Total	425

CHAP. XIII.

Of the Anatomy of the Nerves, Arteries, and Veins in general.

What is the Structure of the Nerves?

The Nerves are round white Bodies enclosed in a double Membrane, communicated to them from the two *Meninges* of the Brain: Their Office is to convey the Animal Spirits into all the Parts.

Where is the Root and first beginning of all the Nerves?

All the Nerves take their Original from the *Medulla Oblongata*, and that of the Spine.

How is the distribution of them made thro' the whole Body?

It is directly perform'd by Conjugations or Pairs, whereof one goes to the Right hand, and the other to the Left: There are nine Pairs of them that proceed from the *Medulla Oblongata*, and enter into the Skull; and a Tenth that comes from the Marrow which lies between the Occipital and the first *Vertebra* of the Neck. It passeth

passeth thro' the Hole of the *Dura Mater*, thro' which the Vertebral Artery enters, to distribute its Branches into several Parts.

To what Use are the nine Pairs of Nerves appropriated, which proceed from the Root of the Brain?

They are chiefly design'd for the Senses; and also for the Motion of their Organs, of which the Ancients discover'd only seven.

The first Pair of Nerves is call'd the *Olfactory*, and serves for the Smelling.

The second Pair is the Optick or Visual Nerves, which serve for the Sight.

The third is term'd *Motorii Oculorum*, being serviceable for the Motion of the Eyes.

The fourth Pair is nam'd *Oculorum Pathetici*, which shews the Passion of the Mind in the Eyes, whereto it imparts a String as well as to the Lips.

The fifth is call'd the *Gustative*, and appropriated to the Taste, because it sends Twigs more especially to the Tongue, as also to the Fore-head, Temples, Face, Nostrils, Teeth, and Privy-Parts.

The sixth is likewise for the Taste, and goes to the Palate.

The seventh is the *Auditive* Nerve, that enters into the *Os Petrosum*, where it divides it self into many Branches, which when gone forth, are distributed to the Muscles of the Tongue, Lips, Mouth, Face, Fore-head, Eye-lids, &c.

The eighth is the *Os Vagum*, or wandering Pair, which is united to the Intercostal Nerve, as also to the Recurrent, Diaphragmatick, Mesenterick, &c.

The ninth Pair, after having form'd a Trunk with the eighth, disperseth its Twigs several ways, whereof one is join'd with the Twig of the tenth, to be distributed together into the Muscle *Sternohyoideus*, and into the Tongue.

The *Intercostal* and *Spinal* are not Pairs of Nerves, but only Branches or Twigs of other Pairs.

What is the Distribution and Use of the thirty Pairs of Nerves that proceed from the Spinal Marrow?

There are seven that go forth from the seven *Vertebrae* of the Neck, twelve from those of the Back, five from the Loins, and six from the *Os Sacrum*, according to the following Progression.

The first of the seven Pairs of Nerves of the Neck proceeds from between the Occipital Bone and the first *Vertebra*, nam'd *Atlas*, its Fibres being lost in the Muscles of the hinder part of the Head and Neck.

The second Pair springs from between the first and second *Vertebra* of the Neck; the Fibres whereof are lost in the Muscles of the Head, and in the Skin of the Face.

The third Pair issueth from between the second and third *Vertebra* of the Neck; and its Fibres are lost in the Flexor Muscles and Extensors of the Neck.

The fourth, fifth, sixth and seventh Pairs proceed from between the *Vertebrae's*, as before, but their Fibres are lost in the Neck of the *Omoplatæ*, in the Arm, and in the *Diaphragme* or Midriff. Here it ought to be observ'd by the way, that the Arms receive Branches not only from the four

four last Pairs of the Nerves of the Neck, but also from the two first Pairs of the Back, which are extended even to the end of the Fingers: Whence it happens that in the Palsie of the Arms, Remedies are usually apply'd to the *Vertebrae* of the Neck; and that in Phlebotomy or letting Blood, care must be taken to avoid pricking the Nerve, which accompanies the Basilisk Vein in the Cubit.

The twelve Pairs of Nerves that have their beginning from between the *Vertebrae* of the Back, are each of them divided into two Branches, as the others; and their Branches are distributed in like manner to the Muscles of the Breast, and to those of the Back and *Abdomen*.

The five Pairs which take their Rise from between the *Vertebrae* of the Loins, have thicker Branches than the others, and the distribution of them is made to the Muscles of the Loins, *Hypogastrium*, and Thighs.

Of the six Pairs of Nerves that proceed from the *Os Sacrum*, the four Upper, with the three Lower of the Loins, send forth Fibres to the Thigh, Leg, and Foot; and the two last Pairs impart Nerves to the *Anus*, Bladder, and Privy-Parts.

What is the Structure of the Arteries?

The Arteries are long and round Canals, consisting of four sorts of Tunicks or Membranes, which have their Rise from the left Ventricle of the Heart, from whence they receive the Blood, and convey it to all the Parts of the Body for their Nourishment.

What is the Construction of these four Tunicks or Membranes of the Arteries?

The

The first being thin and Nervous in its outward Superficies, is in the inside a *Plexus* or Interlacement of small Veins and Arteries, and Fibres of Nerves, which enter into the other following Tunicks to nourish them.

The second sticking close to the former, is altogether full of whitish Glandules, that serve to separate the serous Particles of the Blood.

The third is intirely Musculous, and interwoven with Annular Fibres.

The fourth is very thin, and hath its Fibres all streight.

Whence proceeds the Pulse or beating of the Arteries?

It is derived from the Heart, and exactly answers to its Motion of *Diastole*, and *Systole*.

By what Name is the first Trunk of the Arteries call'd, and what is the Effect of the Distribution made thence to the whole Body?

The first Trunk of the Arteries is nam'd *Aorta*, or the *thick Artery*, which proceeds immediately from the left Ventricle of the Heart, where to it communicates before its departure from the *Pericardium*, one or two small Branches call'd the *Coronary*: Afterward it is divid'd into two Branches, whereof one goes upward, and is term'd the *Ascending Artery*; and the other downward, under the Denomination of the *Descending Artery*.

The *Ascending Artery* ariseth upward along the *Aspera Arteria* or Wind-Pipe to the Clavicles, and is there divided into two Branches, call'd the *Subclavian Arteries*, one whereof goes forward to the Right side, and the other to the Left; and they both send forth on each side divers

vers Branches, which take their Names from the several Parts whereto they are distributed; such are the *Carotides* or *Soporales Interni & Externi*, which pass to the Head; the *Mediastina*, the *Intercostal*, the *Axillar*, and others.

The *Descending Artery*, before its departure from the Breast, affords certain Branches to the *Pericardium*, *Diaphragm*, and lower Ribs; afterward it penetrates the *Diaphragm*, and constitutes seven double Branches. The first is of those that are call'd *Cœliack*, and which go to the Liver and Spleen. The second Branch contains the *Upper Mesenterick*. The third the *Emulgent*, which pass to the Reins. The fourth the *Spermatick*, which are extended to the Genitals. The fifth the *Lower Mesenterick*. The sixth the *Lumbar*. And the seventh the *Muscular*. But as soon as the great Trunk is come downward to the *Os Sacrum*, it divides it self into two thick Arteries nam'd the *Iliack*, which are distributed on both sides, each of them making two Internal and External Branches, which likewise impart Sprigs or lesser Arteries, to the Bladder, *Anus*, *Matrix*, and other adjacent Parts: Then the Master-branch forms the *Crural Arteries* on the inside of the Thighs, which are communicated by multiplying their number even to the ends of the Toes, in passing over the External Ankle-bones of the Feet.

What is the Structure of the Veins?

The Veins are long and round Canals made of four kinds of Tunicks or Membranes, whose Office it is to receive the Blood that remains after the Nourishment is taken, and to carry it back to the Heart to be reviv'd.

What

What is the Form of the four Tunicks that make the Canals of the Veins ?

The first is a Contexture of Nervous and streight Fibres. The second is a *Plexus* of small Vessels that carry the Nourishment. The third is all over beset with Glandules thro' which are filtrated the serous Particles of the Blood contain'd in the Vessels of the second Tunicle. The fourth is a Series of Annular and Musculous or Flethy Fibres.

Which are the most numerous, the Arteries or the Veins ?

The number of the Veins exceeds that of the Arteries ; and there are scarce any Arteries without Veins accompanying them.

Where is the Beginning, and Original of all the Veins ?

All the Veins have their Root in the Liver, and two of the three great Trunks that proceed from thence, are call'd *Vena Portæ*, and *Vena Cava* ; and the third is twofold, viz. the *ascending* and the *descending*.

The *Vena Portæ* is distributed to all the Parts contain'd in the lower Belly, and terminated in the Fundament ; where it makes the Internal Hæmorrhoidal Veins.

The *Vena Cava* is immediately divided into two thick Branches, one whereof ariseth upward to the Right Ventricle of the Heart, and forms the *ascending Vena Cava* ; as the other goes downward to the Feet, and constitutes the *descending*.

What is the Distribution of the ascending Vena Cava ?

It perforates the Diaphragm, goes to the Heart, and ascends from thence to the Clavicles, after

after having communicated to the Midriff in passing a small Branch called the *Pbrenicus*; as also one or two to the Heart, nam'd the *Coronary*; and some others to the upper Ribs, besides the single Branch, term'd *Azygos*, only on the Right side. But the Trunk of the *ascending Vena Cava*, being once come up to the Clavicles, is divided into two Branches, well known by the Name of the *Subclavian*, one whereof stoors forth toward the Right side, and the other toward the Left; and they both make various Ramifications like to those of the thick ascending Artery, by producing the *Cervicales* or *Soporales*, and the Internal and External *Jugulars* that go to the Head: as also the *Axillars*, which pass to the Arms and Shoulders, forming the *Cephalick*, the *Median*, and the *Basilick* on the inside of the Cubit.

The *descending Vena Cava* in like manner accompanieth the Ramifications of the *Aorta*, or thick descending Artery, to the fourth *Vertebra* of the Loins, where it sends forth two Branches, nam'd the *Iliack*, one whereof goes to the Right side, and the other to the Left, both inwardly and outwardly; imparting divers Twigs or lesser Branches to all the Parts contain'd in the *Abdomen* or lower Belly, even as far as the Fundament, where it makes the External *Hæmorrhoidal Veins*. Afterward the outward Branch of the *Iliack* descends within the Thigh, to form the *Crural*, and others, as far as the *Saphæna*, together with those that are at the end of the Feet.

C H A P. XIV.

Of the Anatomy of the Abdomen, or lower Belly.

What is the clearest Division of the Humane Body into various Parts, and that which is most followed in the Anatomical Schools?

It is that which constitutes three Venter, that is to say, the Upper, the Middle, and the Lower, which are the Head, the Thorax or Breast, and the Abdomen or lower Belly, together with the Extremities, which are the Arms and Legs.

What is the lower Belly?

It is a Cavity of the Body that contains the Organs of Nutrition, as the Reins, the Bladder, and all those that are appropriated to Generation in both Sexes.

What is to be consider'd outwardly in the lower Belly?

Its different Regions, and the several parts therein contain'd.

What are these Regions?

They are the Epigastrick, the Umbilical, and the Hypogastrick.

What is their extent?

It is from the Xyphoides or Swordlike Cartilage to the Os Pubis, the division whereof into three equal Parts, constitutes the three different Regions; the Epigastrium being the first upward, the Umbilical the second, and the Hypogastrium the third.

E

What

What are the Parts contain'd in the Epigastrium, and what Place do they possess therein?

The Parts contain'd in the *Epigastrium* are the Liver, the Spleen, the Stomach, and the *Pancreas* or Sweet-bread, which lies underneath: The Stomach takes up the middle before, the Liver being plac'd on the Right side, and the Spleen on the Left; so that these two sides of the *Epigastrick Region*, are call'd the Right and Left *Hypochondria*.

What Parts are there contain'd in the Umbilical Region, and what is their situation?

They are the most part of the thin Intestines or small Guts, viz. the *Duodenum*, the *Fæcum*, and the *Ileon*, which have their Residence in the middle, where they are encircled with a Portion of the two great Guts, *Cæcum* and *Colon*, that take possession of the Sides, otherwise call'd the Flanks. The Reins or Kidneys are also in this Place, above, and somewhat backward.

What Parts are there contain'd in the Hypogastrium, and of what Place are they possess'd?

The greater part of the thick Guts, *Cæcum*, and *Colon*, are enclos'd therein, with the entire *Rectum*; there is also a Portion of the *Ileon*, which hides it self in the sides of the *Iliæ*, or Hip-bones: In the middle under the *Os Pubis*, the Bladder is situated on the Gut *Rectum* in Men, and the Womb in Women lies between the *Rectum* and Bladder.

After what manner is the opening of a Corps of dead Body perform'd at a publick Dissection?

It is begun with a Crucial Incision in the Skin from underneath the Throat downward, traversing from one side to another in the Umbilical Region; then the Skin is raised, beginning at the four Corners, and the *Panniculosus Adiposus* is immediately discover'd: Under this Fat lies a fleshy Membrane, call'd *Membrana Carnosa*; and under that, the common Membrane of all the Muscles of the lower Belly. Thus we have taken a View of what Anatomists commonly term the five Teguments, that is to say, the *Epiderma* or Scarf-Skin, the *Derma* or true Skin, the *Panniculus Adiposus*, the *Panniculus Carnosus* or *Membrana Carnosa*, and the common Membrane of the Muscles.

The five Teguments being remov'd, we meet with as many Muscles on each side, viz. the descending Oblique, the ascending Oblique, the Transverse, the streight, and the Pyramidal, by the means whereof the Belly is extended and contracted. Afterwards appears a Membrane nam'd *Peritoneum*, which contains all the Bowels, and covers the whole lower Belly, being strongly fasten'd to the first and third *Vertebra* of the Back. The Fat skinny Net which lies immediately under the *Peritoneum*, is call'd *Epiploon* and *Omentum*, or the Caul; it floats over the Bowels, keeping them in a continual Suppleness necessary for their Functions, maintains the Heat of the Stomach, and contributes to Digestion.

It remains to take an Account of the Bowels, viz. the Stomach, Mesentery, Liver, Spleen, Kidneys, Bladder, and Guts, together with the Parts appointed for Generation, which in Men

are the Spermatick Vessels, the Testicles, and the *Penis*; and in Women, the Spermatick Vessels, the Testicles or Ovaries, the Womb, and its *Vagina* or Neck.

What is the Stomach?

It is the Receptacle of the Aliments or Food convey'd thither thro' the *Oesophagus* or Gullet, which is a Canal, or kind of streight Gut that reacheth from the Throat to the Mouth of the Stomach. The Stomach it self is situated immediately under the *Diaphragm* or Midriff, between the Liver and the Spleen, having two Orifices, whereof the Left is properly call'd *Stomachus*, or the Upper, and the Right (at its other Extremitie) *Pylorus*, or the lower Orifice. Its Figure resembleth that of a Bag-pipe, and the greater part of its Body lies toward the Left side. It is compos'd of three Membranes. *viz.* one Common, which it receives from the *Peritonaeum*; and two Proper; the two uppermost being smooth, and the innermost altogether wrinkled.

What is the Pancreas or Sweet-bread?

It is a Fat Body, consisting of many Glandules wrapt up in the same Tunicle, being situated under the *Pylorus* or lower Orifice of the Stomach: It helps Digestion, and hath divers other uses; but its principal Office is to separate the serous Particles of the Blood, to be convey'd afterward into the Gut *Duodenum*, by a Canal or Passage, nam'd the *Pancreatick*. This Juice serves to cause the Chyle to ferment with the Choler, in order to separate the grosser Particles from those that ought to enter into the Lacteal Vessels.

Into how many sorts are the Guts distinguish'd?

There

There are two sorts, viz. the thin and the thick.

How many thin or small Guts are there ?

Three ; that is to say, the *Duodenum*, the *Jejunum*, and the *Ileon*.

How many thick Guts are there ?

Three likewise : viz. the *Cæcum*, the *Colon*, and the *Rectum*.

Why are some of them call'd thin Guts, and others thick ?

Because thin are smaller, being appointed only to transport the Chyle out of the Stomach into the Cistern or Receptacle ; whereas the thick are more large and stronger, serving to carry forth the gross Excrements out of the Belly.

Are the six Guts of an equal length ?

No, the *Duodenum*, which is the first of the thin Guts, is only twelve Fingers breadth long : The *Jejunum*, being the second, so call'd because always empty, is five Foot long : The third is nam'd *Ileon*, by reason of its great Turnings, which oblige it to pass to the *Os Ilion*, where it sometimes produceth a Rupture ; it extends it self almost twenty Foot in length.

The first of the thick Guts, known by the Name of *Cæcum* is very short, and properly only an *Appendix* or Bag of two thirds of an Inch in length : That which follows is the *Colon*, being the largest of all, and full of little Cells, which are fill'd sometimes with Wind and other Matters, that excite the Pains of the Cholick. It encompasseth the thin Guts, in passing from the top to the bottom of the Belly, by the means of its great Circumvolutions, and is from eight to nine Foot long. The last is the *Rectum*, or

streight Gut, so nam'd, because it goes directly to the Fundament: It is no longer than ones Hand, but it is fleshy, and situated upon the Os Sacrum, and the Coccyx or Rump-bone.

What is the Peristaltick Motion of the Guts?

It is the successive Motion and Undulation, whereby the Guts insensibly push forward from the top to the bottom, the Matters contain'd in them; and that Motion which on the contrary is perform'd from the bottom to the top, is term'd the *Antiperistaltick*, as it happens in the *Black Passion*, or twisting of the Guts, call'd *Domine Misere*, by reason of its intolerable Pain.

What is the Mesentery?

It is a kind of Membrane somewhat fleshy, which is join'd to the Spine in the bottom and middle of the Belly, and by its folding keeps all the Guts steady in their place; it is all over beset with Red, White, and Lymphatick Vessels; that is to say, those that carry the Blood, Chyle, and *Lympha*, which serves to cause this last to run more freely, and to ferment. Three notable Glandules are also observ'd therein, the greatest whereof lies in the middle, and is nam'd *Asellius's Pancreas*; the two other lesser are call'd *Lumbar Glandules*, as being situated near the Left Kidney. From each of these Glandules proceeds a small Branch; and both are united together to make the great *Lacteal Vein*, or *Thoracick Canal*. This Tube conveys the Chyle along the *Vertebrae* of the Back to the Left *Subclavian Vein*; from whence it passeth into the ascending *Vena Cava*, and descends into the Right Ventricle of the Heart, where

where it assumes the form of Blood ; from whence it passeth to the Lungs thro' the *Pulmonary Artery* ; then it returns to the Heart thro' the *Pulmonary Vein*, and goes forth again thro' the Left Ventricle of the Heart, between the *Aorta* or great Artery, to be afterward distributed to all the Parts of the Body. Thus is the Chyle discharged into the Blood, and Circulates with it till it is assimilated and converted into its Substance.

What is the Liver ?

The Liver, being the thickest of all the Bowels, is plac'd in the Right *Hypochondrium*, at the distance only of a Fingers breadth from the Diaphragm ; its Figure much resembling that of a thick piece of Beef ; it is Convex on the outside, and Concave within ; its Substance is soft and tender, its Colour and Consistence being like coagulated Blood : It is cleft at bottom, and divided into two Lobes, viz. one greater, and the other less : Its Office is to purify the Mass of Blood by Filtration ; and it is bound by two strong Ligaments, the first whereof adheres to the Diaphragm, and the second to the *Xiphoides* or Sword-like Cartilage. Two great Veins take their Rise from hence, the *Vena Porta*, and the *Vena Cava*, which form innumerable Branches, as it were Roots in the Body of the Liver. The Gall-bladder is fasten'd to the hollow part thereof, and dischargeth its Choler into the Gut *Duodenum*, thro' the Vessels that bear the Name of *Meatus Choledochi*, or *Ductus Biliares*. This Choler is not a meer Excrement, but on the contrary of singular Use in causing the Fermentation of the Chyle, and bringing it to perfection.

What is the Spleen ?

The Spleen is a Bowel resembling a Hart's Tongue in shape, and situated in the Left *Hypochondrium*, over-against the Liver : Its length is about half a Foot, and its breadth equal to that of three Fingers ; its Substance being soft, as that of the Liver, and its Colour like dark coagulated Blood : It is fasten'd to the *Peritoneum*, Left Kidney, Diaphragm, and to the *Caul* on the inside ; as also to the Stomach by certain Veins, call'd *Vasa Brevia* ; nevertheless these Ligatures do not hinder it from shifting here and there in the lower Belly, where it often changeth its place, and causeth many dreadful Symptoms by its irregular Motions. Its Office is to subtilize the Blood by cleansing and refining it.

What are the Reins ?

The Reins or Kidneys are Parts of a fleshy Consistence, harder and more firm than that of the Liver and Spleen : They are both situated in the sides of the Umbilical Region, upon the Muscle *Psoas*, between the two Tunicks of the *Peritoneum* ; but the Right is lower than the Left : Their Shape resembleth that of a French Bean, and they receive Nerves from the Stomach, whence Vomitings are frequently occasion'd in Nephritick Cholicks : They are fasten'd to the Midriff, Loins, and *Aorta*, by the *Emulgent Arteries*, as also to the Bladder by the *Ureters*. The Right Kidney likewise adheres to the Gut *Cecum*, and the Left to the *Colon*. Their Office is to filtrate or strain the Urine into the *Pelves* or Basons, which they have in the middle of their Body, and to cause

it to run thro' the Vessels call'd *Ureters* into the Bladder.

Immediately above the Reins on each side, is a flat and soft Glandule, of the thickness of a Nut; they are nam'd *Renal Glandules*, or *Capsula Atribilaria*, because they contain a blackish Liquor, which, as some think, serves as it were Leven for the Blood, to set it a fermenting.

What is the Bladder?

It is the Basin or Reserver of Urines, of a Membranous Substance as the Stomach, being plac'd in the middle of the Hypogastrick Region; so that it is guarded by the *Os Sacrum* behind, and by the *Os Pubis* before: Two Parts are to be distinguish'd therein, viz. its Bottom and Top; by its Membranous Bottom it is join'd to the Navel, and suspended by the means of the *Urachus*, and the two Umbilical Arteries which degenerate into Ligaments in adult Persons: As by its fleshy Neck, longer and crooked in Men, and shorter and streight in Women, it cleaves to the *Intestinum Rectum* in the former, and to the Neck of the Womb in the latter. Lastly, its Office is to receive the Urine, to keep it, and to discharge it from time to time.

What are the Genitals in Men?

They are the Spermatick Vessels, the Testicles, and the *Penis*. The Spermatick Vessels are a Vein and an Artery on each side; the former proceeding from the *Aorta*, or thick Artery of the Heart; and the other from the Branches of the *Vena Cava* of the Liver. These Arteries and Veins are terminated in the Body of the Testicles, which are two in number, enclos'd within the *Scrotum*.

The Office of the Testicles is to filtrate the Seed, which is brought thither from all the parts of the Body, through the Spermatick Vessels, call'd *Præparantia*, and afterwards to cause it to pass through others nam'd *Deferentia*, to the *Vesiculæ Seminales*, from whence it is forc'd into the *Ureters* through two small and very short Canals.

The *Penis* or Yard is a Nervous and Membranous Part, well furnish'd with Veins and Arteries, containing in the middle the Canal of the *Ureters*. Its Extremity, which consists of a very delicate and spongy sort of Flesh, is call'd *Balanus*, or *Glans*, and the Nut, the Skin that covers it being nam'd the *Præputium*, or the Fore-Skin. Thus by the means of this swell'd Part, and stiff thro' the affluence of the Spirits, the Male injects his Seed into the Womb of the Female, to propagate his Kind.

What are the Parts appropriated to Generation in Women?

They are the Spermatick Vessels, the Ovaries or Testicles, and the Womb. The Spermatick Vessels are a Vein and an Artery on each side, as in Men: The Ovaries or Testicles, situated on the side of the bottom of the Womb, are almost of the same bigness with those of Men, but of a round and flat Figure. The *Vesicula*, or little Bladders which they contain, are usually term'd *Ova* or Eggs by Modern Anatomists; and the Vessels that pass from these Testicles or Ovaries to the *Cornua* of the *Uterus*, are call'd *Deferentia* or *Ejaculatoria*.

The *Matrix*, *Uterus* or Womb, is the principal Organ of Generation, and the place where it is perform'd, resembling the Figure of a Pear with

with its Head upward, and being situated between the Gut *Rectum* and the Bladder : It is of a fleshy and membranous Substance, retain'd in its place by four Ligaments, fasten'd to the bottom ; whereof the two upper are large ones, proceeding from the Loins, and the two lower round, taking their Rise from the Groin, where they form a kind of Goose-Foot, which is extended to the *Os Pubis*, and the flat part of the Thighs ; which is the Cause that Women are in danger of Miscarrying when they fall upon their Knees.

The Exteriour Neck of the Womb, call'd *Vagina*, is made almost in form of a Throat or Gullet, extending it self outwardly to the sides of the Lips of the *Pudendum*, and being terminated inwardly at the internal Orifice of the Womb. the shape whereof resembles that of the Muzzle or Nose of a Puppy. The outward Neck of the Womb is fasten'd to the Bladder and the *Os Pubis* before, and in the hinder part to the *Os Sacrum* : Between the Lips of the *Pudendum* lie the *Nymphae*, which are plac'd at the Extremity of the Canal of the Bladder, to convey the Urine ; and somewhat farther appear four Caruncles, or small pieces of Flesh, at the Entrance of the *Vagina*, which when join'd together make the thin Membrane call'd *Hymen*.

C H A P. XV.

*Of the Anatomy of the Thorax, Breast,
or middle Venter.**What is the Breast?*

It is a Cavity in which the Heart and the Lungs are principally enclos'd.

What is to be consider'd outwardly in the Breast?

Its extent, and the situation of the Parts therein contain'd.

What is its extent?

It is extended from the *Clavicles* to the *Xiphoides*, or *Sword-like Cartilage* on the forepart, and bounded on the hinder by the *twelfth Vertebra* of the Back, having all the *Ribs* to form its Circumference, and the *Diaphragm* for its Bounds at bottom, separating it from the *Abdomen* or lower Belly.

What is the situation of the Parts contain'd in the Breast?

The Lungs take up the upper Region, and fill almost the whole Space, descending at the distance of two Fingers breadth from the *Diaphragm*; the Heart is situated in the middle, bearing its Point somewhat towards the Left side, under the Lobes of the Lungs, which are divided by the *Mediastinum* that distinguishes them into the Right and Left Parts.

How is the Breast Anatomiz'd or open'd?

After

After the dissection of the five Teguments, and the removal of the Muscles, as in the lower Belly, the Anatomist proceeds to lift up the *Sternum* or Breast-bone, by separating it from the Ribs; then it is laid upon the Face, or else entirely taken away, to the end that the internal Parts of the Breast may be more clearly discover'd; whereupon immediately appear, the Heart, the Lungs, the Diaphragm, and the *Mediastinum*, which sticks to the *Sternum* throughout its whole length.

What is the Heart?

It is a most noble Part, being the Fountain of Life, and the first Original of the Motion of all the others; on which account it is call'd *Primum vivens*, & *ultimum moriens*; that is to say, the first Member that begins to live, and the last that dies.

What Parts are to be consider'd in the Heart?

Its fleshy Substance, with all its Fibres turn'd round like the Skrews of a Vice; its *Basis*, Point, Auricles, Ventricles, large Vessels, *Pericardium*, and Ligatures or Tyes: The *Basis* is the uppermost and broadest part; the Point is the lowermost and narrowest part; the two Auricles or small Ears being as it were little Cisterns or Receptacles, that pour the Blood by degrees into the Heart, are situated on each side above the Ventricles. The Ventricles, which are likewise two in number, are certain Cavities at its Right and Left Sides. The large Vessels are the *Aorta* or great Artery, and the *Vena Cava*, together with the Pulmonary Artery and Vein. The *Pericardium* is a kind of Bag fill'd with Water, wherein the Heart is kept; which is fasten'd

fasten'd to the *Mediaſtinum* by its *Baſis*, and to the large Veſſels that enter and go out of its Ventricles.

What are the Terms appropriated to the continual beating of the Heart?

They are *Diastole* and *Systole*, from whence proceed two ſeveral Motions, the firſt whereof is that of Dilatation, and the other of Contraction, communicated to all the Arteries which have the ſame Pulse.

To what uſe ſerves the Water contain'd in the Pericardium?

It prevents the drying of the Heart by its perpetual Motion.

What are the Lungs?

They are an Organ ſerving for Reſpiration, of a ſoft Subſtance, and porous as a Sponge, being all over replenish'd with Arteries, Veins, Nerves, and Lymphatick Veſſels, and perforated with ſmall Cartilaginous Tubes, that are imparted to it from the Wind-Pipe, and are call'd *Bronchia*. Their natural Colour is a pale Red, and marbl'd dark Brown; and their whole Body is wrapt up in a fine ſmooth Membrane, which they receive from the *Pleura*. They are ſuſpended by the Wind-Pipe, by their proper Artery and Vein, and by the Ligatures that faſten them to the *Sternum*, *Mediaſtinum*, and frequently to the *Pleura* it ſelf; They are alſo divided into the Right and Left Parts by the *Mediaſtinum*; having four or five Lobes, whereof thoſe on the Left ſide cover the Heart. Their continual Motion conſiſts in *Inſpiration*, to take in the Air, and *Expiration*, to drive it out. The *Larynx* makes the Entrance of the Wind-Pipe
into

into the Lungs, and the *Pharynx* that of the *Oesophagus* or Gullet, at the bottom of the Mouth, to pass into the Stomach.

C H A P. XVI.

Of the Anatomy of the Head, or upper Venter.

What is the Head?

It is a bony Part, that contains and encloseth the Brain within its Cavity.

What is most remarkable in the outward parts of the Head?

The Temporal Arteries, the *Crotaphiteæ*, or Temporal Muscles, and the Sutures of the Skull.

Why are these things considerable?

The Temporal Arteries are of good Note, because they are expos'd on the outside, lying even with the Skin. The Temporal Muscles are so likewise, in regard that they cannot be hurt without danger of Convulsions, by reason of the *Pericranium*, with which they are cover'd. And the Sutures, because the *Meninges* of the Brain proceed from thence to form the *Pericranium*.

What is the Pericranium?

It is a Membrane that lies under the thick hairy Skin of the Head, and immediately covers the Skull.

What are the Meninges?

They are two Membranes that enclose the Substance or Marrow of the Brain.

What is a Suture?

It

It is a kind of thick Seam or Stich, that serves to unite the Bones of the Skull.

How many sorts of Sutures are there ?

There are two sorts, viz. the true, and the false or Bastard.

What are the true Sutures ?

They are three in number, namely the *Sagittal*, the *Coronal*. and the *Lambdoidal*.

What is the disposition or situation of the true Sutures ?

The *Sagittal* is streight, beginning in the middle of the Fore-head, and sometimes at the root of the Nose, and being terminated behind, at the joining of the two Branches of the *Lambdoidal Suture*.

The *Coronal* appears in form of a Crown, passing up to the middle of the Head, and descending thro' the Temples, to finish its Circumference to the place call'd the *Fontanel* or Mould, the Root of the Nose.

The *Lambdoidal Suture* is made like an open Pair of Compasses, the Legs whereof are extended toward the Shoulders; and the Batton is in the top of the Head backward.

What are the Bastard Sutures ?

They are those that are call'd *Squamous* or scaly.

What is the disposition or natural situation of these false Sutures.

They are plac'd at the two sides of the Head, and make a Semi-Circle of the bigness of the Ears, round the same Ears.

What difference is there between the true and spurious Sutures ?

The true Sutures are made in form of the Teeth of a Saw, which enter one into the other; and the false or Bastard ones are those
that

that resemble the Scales of Fishes, which are join'd together by passing one over the other.

What is the use of the Sutures ?

The Ancients were of Opinion, that they were made to hinder the Fracture of one Skull-Bone from passing thro' the whole Head ; but there is more reason to believe that they have the three following Uses, that is to say, 1. To promote the transpiration of the Brain. 2. To give Passage to the Vessels that go to the Diploe. 3. To retain the *Meninges*, and to support the Mass of the Brain, which is included in them.

What are the Names of the Bones that compose the Skull ?

The Bone of the fore part of the Head is call'd *Sinciput*, or the Fore-head Bone, as also the *Frontal* or *Coronal* Bone. The Bone of the hinder part, enclos'd within the *Lambdoidal* Suture, is term'd the *Occipital*. The two Bones that form the upper part, and are distinguish'd by the *Sagittal* Suture, bear the Name of *Parietals*, one being on the Right side, and the other on the Left. And those behind the Ears are call'd *Temporal*, *Squamosa*, or *Petrosa*. These also are distinguish'd into the Right and Left Temporals, and are join'd to the bottom of the Parietal by a bastard squamous Suture.

What is most remarkable in the thickness of the Skull Bones ?

The *Diploe*, which is nothing else but a *Plexus* or *Contexture* of small Vessels, that nourish the Bones, and in the middle of their thickness make the distinction of the first and second Tablature of the Bones ; whence it sometimes happens

pens that an exfoliative Trepan, or Semi-Trepan, is sufficient, when the first of these two Tables is only broken, the other remaining entire.

Is the Brain which is preserv'd in the Skull all of one Piece, or one equal Mass?

No, it is distinguish'd by the means of the *Meninges* into the Brain it self, and the *Cerebellum* or little Brain; the Brain, properly so called, takes up almost the whole Cavity of the Skull, and the *Cerebellum* is lodg'd altogether in the hinder part, where it constitutes only one entire Body; whereas the former is divided into the Right and Left Parts by the *Meninges*, which separate it even to the bottom, whence these Foldings are call'd *Falx*; i. e. a *Scythe* or *Sickle*.

What is chiefly remarkable in the Substance of the Brain?

The *Ventricles* or *Cavities* which are found therein, together with the great Number of *Veins*, *Arteries*, *Lymphatick Vessels*, and *Nerves*, that carry Sense to all the Parts of the Body, and *Spirits* for their Motion.

An exact Historical Account of all the Holes of the Skull, and the Vessels that pass thro' them.

To attain to an exact Knowledge of all the Holes with which the inside of the *Basis* of the Skull is perforated, they are to be consider'd either with respect to the *Nerves*, or to the *Blood Vessels*.

There

There are nine Pairs of Nerves that arise from the *Medulla Oblongata*, and go forth out of the Skull through many Holes hereafter nam'd.

The first Pair is that of the *Olfactory* Nerves, appropriated to the Sense of Smelling, which are divided below the *Os Cribriforme*, or Sieve like Bone, into divers Threads, that passing into the Nose through many Holes with which this Bone is pierc'd, are distributed to the inner Tunic of the Nose.

The second Pair is that of the *Optic* or Visual Nerves, that pass into the Orbits of the Eyes, thro' certain peculiar Holes made in the *Os Sphenoides*, or Wedge-like Bone, immediately above the *Anterior Processus Clinoides*.

In the Portion of the *Os Sphenoides*, that makes the *Bas*s of the Orbit, lies a Fissure about seven or eight Hairs breadth long, which is to be observ'd chiefly at the bottom, that is to say, below the Hole, thro' which the Optick Nerve passeth; where it is almost round, and larger than at the top, where it is terminated in a very long and acute Angle.

There are many Pairs of Nerves that enter into the Orbit through this Fissure, viz. 1. The third Pair, call'd the *Motorii Oculorum*, 2. The fourth Pair, nam'd *Pathetici*, by D. Willis. And 3. The whole sixth Pair. Besides these three Pairs, which go entire thro' this Cleft, there is also a Passage for the upper Branch of the foremost Fibre of the fifth Pair, which the same renowned Physician calls the *Ophthalmick* Branch. Beyond the lower part of the said Fissure, toward the hinder part of the Head, is to be seen

in

in the *Os Sphenoides* on each side, a Hole that doth not penetrate the *Basis* of the Skull, but makes a kind of *Ductus*, about an Hair's breadth long, which is open'd behind the Orbit on the top of the Space between the *Processus Pterygoïdes*, and a third Bone of the Jaw; thro' this *Ductus* runs the lower Branch of the foremost Fibre of the fifth Pair.

About the length of two Hairs breadth beyond these *Ductus*'s, we may also discover in the *Os Sphenoides*, or Wedge like Bone, two Holes of an Oblong and almost Oval Figure, which are plac'd in the hindermost sides of that of the *Os Sphenoides*, and give passage to the hindermost Fibre of the fifth Pair.

The Hole thro' which runs the *Auditory Nerve*, that makes the seventh Pair, is in the middle of the hinder part of the *Os Petrosum*, that looks toward the *Cerebellum*: This Hole being very large, is the Entrance of a *Ductus* that is hollow'd in the *Os Petrosum*, and which sinking obliquely from the fore part backward, for the depth of about two Hairs breadth, forms as it were the bottom of the Sack, the lowermost part whereof is terminated partly by the *Basis* of the *Cochlea*, and partly by a Portion of the Mouth of the *Vestibulum*. At the bottom of this *Ductus* are many Holes, but the most considerable is that of the upper part, through which passeth a Portion of the *Auditory Nerve*. This is also the Entrance of another *Ductus* made in the *Os Petrosum*, which is open'd between the *Mistoides* and *Styloides*: The other Holes afford Passage to the Branches of the soft Portion of the same *Auditory Nerve*.

Below

Below this *Ductus* there is a remarkable Hole form'd by the meeting of two hollow Cuts, the larger whereof is in the Occipital Bone, and the other in the lower part of the *Processus Petrosus*: From the middle of the upper part of this Hole issueth forth a small Prominence or bony Point, whereto is join'd an Appendix of the *Dura Mater*, which divides the Hole into two Parts; so that through the foremost Orifice passeth the Nerve of the eighth Pair, and that which is call'd the *Spinal Nerve*. We shall have occasion hereafter to shew the Use of the hinder Orifice.

Near the great Hole of the Occipital Bone, from whence proceeds the *Medulla Oblongata*, we may observe a Hole almost round and oblong, thro' which passeth the Nerve of the Ninth Pair: This Hole is intirely situat'd in the Occipital Bone, and making a little Way in the Bone, passeth obliquely from the back-Part forward. In the Inside of the Skull this Hole is sometimes double, but its two Entrances are re-united in the outward-part of the Skull; and the two Branches that form the Origine of this Nerve, and which pass thro' these two Holes, are likewise re-united at their Departure. These are the Passages of the nine Pairs of Nerves that proceed from the *Medulla Oblongata*, and it remains only to shew the Paths, thro' which the Intercostal Nerve goes forth, as also that of the tenth Pair. The Intercostal runs out of the Skull thro' the *Ductus* that gives Entrance to the Internal *Processus*. As for the tenth Pair, in regard that it ariseth from the Marrow which is enclos'd between the Occipital Bone

Bone and the first *Vertebra*, it goes forth thro' the Hole of the *Dura Mater*, where the *Vertebral Artery* enters.

To know well the Holes, thro' which the Vessels that belong to the inner-part of the Head enter, and issue forth, it is requisite to distinguish them into those which are distributed to the *Dura Mater*, and those that are appointed for the Brain. The Vessels of the *Dura Mater*, are Branches of the *Carotid* or *Vertebral Arteries*.

In the *Os Sphenoides*, or Wedge-like Bone, behind the Hole, thro' which passeth the hindermost Fibre of the fifth Pair of Nerves lies another small Hole, almost round, that gives Entrance to a Branch of the *External Carotid Artery*, which in entering, immediately adheres to the *Dura Mater*, and forms many Ramifications to over-spread the whole Portion of this Membrane, which covers the Sides and the upper-Part of the Brain.

At the bottom and top of the lateral outward Part of the Orbit of the Eye, above the acute Angle, for want of the *Os Sphenoides*, there is a Hole, thro' which passeth an Artery, being a Twig of a branch of the *Internal Carotid* which is diffus'd in the Eye, and distributed to almost the whole Portion of the *Dura Mater*, that covers the Fore-part of the Brain.

The *Vertebral Artery* in entering into the Skull, smeth it on each side with a considerable branch, which is dispers'd throughout the whole Portion of the *Dura Mater* that covers the *Cerebellum*.

As for the *Veins* that accompany these *Arteries*, they almost all go out of the Skull thro' the same Holes where the other enters.

There are four thick *Arteries* which convey to the Brain the Matter with which it is nourish'd, and that whereof the Spirits are form'd, viz. the two *Internal Carotids* and the two *Vertebrals*.

The *Internal Carotid Arteries* enter into the Skull thro' a particular *Ductus* made in the Temporal Bone, the Mouth thereof being of an Oval Figure, and situated in the outward Part of the *Basis* of the Skull, before the Hole of the *Internal Jugular*. This *Ductus* extends it self obliquely from the back-side forward, and after having made about Three Hairs breadth in length, is terminated in the hinder-part of the *Os Sphenoides*. The Artery traverseth the whole winding Compass of this *Ductus*, which resembles the Figure of the *Roman Letter S*, and at the Mouth of the same *Ductus* runs under the *Dura Mater* along the Sides of the *Os Sphenoides* to the *Anterior Processus Clinoides*, where it riseth up again, to perforate the *Dura Mater*, and to adhere to the Root of the Brain. These *Vessels*, in like manner, after their Departure from the Bone of the Temples, to the Place where they pierce the *Dura Mater*, make a second Circuit in form of the *Roman Character S*. At the Place where these *Carotid Arteries* penetrate the *Dura Mater*, they send forth a thick branch, which enters into the Orbit of the Eye, by the lower-part of the Hole, thro' which the *Optick Nerve* hath its Passage.

The *Vertebral Arteries* proceeding from the Holes of the transverse *Process* of the first *Vertebra*, turn about in passing under the upper *Oblique Processes* of the seven *Vertebrae*: Afterward they perforate the *Dura Mater*, and running under the Marrow, enter into the Skull thro' the Occipital Hole; then inclining one toward another, they are re-united, and form only one single Trunk.

The Veins that bring back the Blood from the Substance of the Brain, are emptied into the *Sinus's* of the *Dura Mater*, which are all discharged into those that are call'd *Lateral*, which last go out of the Skull immediately under the Nerves of the eighth Pair, thro' the hinder-part of the Hole made by the meeting of the *Occipital Bone*, and the *Apopophysis Petrosa*. These *Lateral Sinus's* fall into the *Internal Jugulars*, which are receiv'd into a considerable Cavity hollow'd on each side in the outward part of the *Basis* of the Skull, which is nam'd the Pit or Hole of the *Internal Jugular*.

In the upper and hinder-part of the Hole, from whence the *Lateral Sinus's* issue forth, is to be seen an opening in the Extremity of a *Ductus*, the Mouth whereof lies behind the *Condyls*, which are on the sides of the Occipital Trunk: This *Ductus* is extended about the length of two Hairs breadth in the Bone, and the Canal enclos'd therein is open'd immediately into the *Vertebral Sinus*: So that one might affirm it to be as it were its Original Source. Whence it appears that the Blood contain'd in the *Lateral Sinus's* is empty'd thro' two Places; the greater Portion thereof descending in the *Jugulars*
from

from the Neck, and the other in the *Vertebral Sinus's*: Sometimes those *Ductus's* are found only on one side, another while both are stopp'd up, and then the Blood contain'd in the lateral *Sinus's* is discharg'd into the *Internal Jugulars*.

Behind the *Processus Mastoïdes* on each side, is a remarkable Hole, thro' which passeth a thick Vein, which brings back part of the Blood that hath been distributed to the Teguments and Muscles, which cover part of the *Occiput*, or hinder-side of the Head: This Vein is open'd into the lateral *Sinus's* at the Place where they begin to turn about. But in the Heads of some Persons, this Hole is found only on one side, and even sometimes not at all; in which case the Blood contain'd in these Vessels falls into the *External Jugulars*, with which the Branches of this Vein have a Communication.

In each *Parietal Bone* on the side of the *Sagittal Suture*, at a little Distance from the *Lambdoidal*, appears a Hole, thro' which passeth a Vein, that brings back the Blood of the Teguments of the Head, and dischargeth it self into the upper *Longitudinal Sinus*. These Holes are sometimes stopp'd up on one side, and sometimes on both; and then the Blood contain'd in the Branches of this Vein runs into the *External Jugulars*.

In the middle of the *Sella* of the *Os Sphenoides*, we may observe one or two small Holes, thro' which (according to the Opinion of some Modern Anatomists) the *Lympha* contain'd in the *Glandula Pituitaria* is thrown in-

to the *Sinus* of the *Sella* of the *Os Sphenoides*; nevertheless it is certain, that these Holes are fill'd only with Blood Vessels, which carry and bring back the Blood of the Bones and Membranes, whereof those *Sinus's* are compos'd; besides that, these Holes are rarely found in adult Persons.

Between the Spine of the *Coronal Bone* and the *Crista Galli*, is a Hole, which serves as an Entrance for a *Ductus*, which sinks from the top to the bottom, the length of about two Hairs breadth into the Substance of the inner Table of that Bone: The Root of the upper *Longitudinal Sinus* is strongly implanted in this Hole, which also affords a Passage to some Blood Vessels appointed for the Nourishment of this inner Table.

Many other small Holes are found in divers Places of the *Basis* of the Skull; the chief whereof are those that are observ'd in the *Apophysis Petrosa*, and give Passage to a great Number of Vessels that serve for the Nutriment of that part of the Temporal Bone which is call'd the *Tympanum* or Drum: The other Holes are principally design'd for the Vessels that are serviceable in the nourishing of divers parts of the *Basis* of the Skull.

C H A P. XVII.

The Following Anatomical History was communicated to me by Mr. Francis Poupart, tho' he does not assume it as his own, it being extracted from some Modern Authors, tho' with some Difference in the Order.

A Description of the Brain.

Whoever would know the true Reasons of the Motion of a Watch, can never satisfy himself better than by taking it in pieces after he has invented its Outside: In the same manner the Naturalist who inquires into the Causes of the Functions of the Brain, must dissect the wonderful Machine, and consider well all the Parts which compose it.

After the five common Teguments are removed, there remain three more particular to the Head alone; the one Carnous, the other Flešhy, last and Bony, viz. the Muscles, the *Pericranium* and the Skull, which serves as a natural Helmet to cover the Brain, and defend it from the Injuries which so soft a Substance would otherwise be expos'd to. I shall not spend time in observing that the Skull is divided into two Tables, which are separated by a Spungy or Cavernous Space, call'd the *Diploe*; that this Natural Armour is made of Pieces well adjusted together, and distinguish'd by junctures, call'd *Sutures*, which are so many Vents thro'

which the Vapours of the Brain exhale; that the inner Surface of the Skull is lin'd with the *Dura Mater*, and has several Furrows imprinted in it by the beating of the Arteries of the *Dura Mater*, whilst the Substance of that Bone was tender; nor, in short, that the round Figure was given to it in Men, whose Brain is larger than that of other Animals, that it might be more capacious and solid. For the Famous Mr. Boyle having put two Glass Vessels into his Pneumatick Engine, and exhausted the Air, suffering it to rush in of a sudden by opening it a Passage, he found the round Glass entire, when that of an irregular Figure was broke by the *Impetus* of the Air. I shall pass over these Considerations, since they do not assist us much in the Knowledge of the Animal Operations, which it is my present Design to speak of.

When the Cap is taken off the Brain, it presents it self to view as it is cover'd with the *Dura* and *Pia Mater*, which are interlac'd with an Infinity of Veins and Arteries; from the beating of which, its *Systole* and *Diastole* proceeds.

The *Dura Mater*, besides an Infinity of small Vessels, has four considerable Branches, call'd *Sinus's*, which have a Pulsation like Arteries, and bring back the reflux Blood into the Veins.

Some have thought the Animal Spirits are generated there, and others allot them to cool the Blood which comes out of the Arteries. But their true Use is like a *Batneum Mariæ*, by a mild and moist Heat to help the Distillation of the

the Animal Spirits in the Cinereous Substance of the Brain; and bring back the superfluous Blood into the Jugular Veins. All the Veins of this Part are like so many small Brooks, which discharge Blood into four great Rivers.

The *Sinus* extending along the *Falx*, answers to the Sagittal Suture, is the largest of all; and the *Lambdoidal* Suture is larger than the fourth, which is call'd *Torcular*. This is form'd by the Concourse of the three former, and strikes into the inmost Parts of the Brain. When it arrives at the *Glandula Pinealis*, which adheres close to it by a certain Number of Vessels, it makes a Fork, one branch going to the right, and the other to the left Ventricle, and there forms the *Plexus Choroides*, by joining to two Arteries, which rise from the *Carotids*, and proceed along the sides of the *Medulla oblongata*, and these *Plexus* follow the *Medulla Oblongata*, if it be drawn back.

They are likewise compos'd of a Quantity of Lymphatick Vessels, and many imperceptible Glands, which gives occasion to believe that part of the Serosities found in the Ventricles of the Brain, may be separated there. However, it is probable this is not the chief Use of these *Plexus*; but rather that they serve as a *Balneum Mariæ*, whose Heat keeps Motion in the Animal Spirits, lodg'd in the *Corpus Callosum* immediately above them, which otherwise wou'd be cold, having few or no Spirits to heat them. The Heat of these *Plexus* further serves to keep the Serosities in the Ventricles fluid, which otherwise wou'd be dispos'd to thicken by the Cold, and by this means prevents Apoplexies and

Palsies, which the Stagnation of these condens'd Liquors, or the Obstruction of the *Infundibulum* would otherwise cause.

As Rivers divide Countries, so these *Sinus*, as so many Currents of Water, separate the Brain into three Provinces. The Lateral ones make a Separation of the Brain and *Cerebellum*. The former is divided into two Hemispheres by the Longitudinal one, which breaks the Impetuosity by several Ligaments, which may aptly be compar'd to Chains drawn across Streets to stop the Confluence of People. Besides this, these Ligaments serve to keep the *Sinus* at a certain distance, for fear the Channel shou'd be too much enlarg'd by extraordinary Inundations. These serve too as Bridles, to give a Check to, or hasten the Circulation of the Blood, by their Contraction and Relaxation. For the reflux Blood having lost its most spirituous Part in the Cine-reous Part of the Brain; and having left behind it in the Glands of the Membranes a Part of its Serosity, must necessarily be thicker. Therefore to prevent it from stagnating in the *Sinus*, there are Arteries inserted into it which add new Life and Motion to it.

The Veins which come to these *Sinus's* have their Course from before backwards in Animals, with their Head hanging down, lest a contrary Position might give way for the Blood to fall down to the Nostrils, where it would be enclosed by its Weight: but in Men these Veins tend from behind forwards; from whence it proceeds that Men are more subject to bleed at Nose than Beasts.

And since these Lateral Sinus's may be more press'd by the Cerebellum in Beasts, who have their Head hanging down, and especially such as are design'd for Swiftneſs, as Dogs; or Fighting, as Lions, which might ſtop the Circulation of the Blood in the Brain; Nature has plac'd a Bone of a Triangular Figure between the Cerebellum and theſe Sinus's, to prevent Compreſſion. Without this Precaution, the Weight of the Cerebellum bearing on the Brain, would preſs together its Channels, and hinder the free Motion of the Animal Spirits, and cauſe a perpetual Lethargy.

It is on theſe Sinus's chiefly that the Convex Surface of the Brain is tied to the Skull which helps to ſuſpend the Brain, and its Concave Surface adheres to the fiſt by ſeveral Veſſels.

This is interwoven with a great Number of Arteries, the leaſt of which have but one Tunick and as many Veins which form divers admirable Labyrinths. It does all the good Offices to the Brain which a tender Mother can do to her Infant. It keeps it warm in her Boſom when it has not ſtrength to ſtand of it ſelf. It defends and keeps it from external Injuries, and gives its Breſt to draw Nouriſhment from: The Dura Mater does the ſame Services for the Brain; and after that there is no room to aſk whence it has its Name, tho' ſome pretend theſe Membranes are ſo call'd, becauſe the reſt in all Parts of the body ſpring from them.

Tho' the Pia Mater be a very thin Membrane, yet it is beſet with a great Number of Glands, which can only be ſeen by the Microſcope; or

After they have been soak'd for some time in warm Water, in which they swell, as in a *Hydrocephalus* : for then being fill'd with Serosities, they are considerable. They were first discover'd by Dr. *Willis* in an Hydropical Head ; but it cannot be said they are the Products of a Disease ; because they are found naturally in the Head of all Animals.

All these Glands being very small, do not hinder the *Pia Mater*, which abounds with them, from insinuating it self into the deepest *Anfractus* in the cinereous Part of the Brain, stopping on the Edge of the callous Substance, on which it bestows several Vessels, tho' Dr. *Willis* has not observ'd any.

The Brain being intirely divested of these two Membranes its Cinerous Ash-colour'd Substance appears under. This Colour is not superficial, but penetrates to the bottom of the Sinuosities, under which lies the Medullary Part, which is as white as Snow.

It is very probable that the different Colour of these two Parts does only proceed from the different Dispositions of their Surfaces ; and that the one is white, because it reflects more light, and the other brown ; because it reflects less Light towards our Eyes, part of which it drinks into its Pores.

But a more particular Cause of the brown Colour may be given, by ascribing it to the *Sal Armoniac* which is very plentiful in the Brain, which by its Volatility is sublim'd to the upper Part, being stop'd there by the close Contexture of the Skull. The Scent of the Brain, especially when it begins to corrupt,

rupt, and the Chymical Anatomy of it by Distillation, shew it is fill'd with such a Salt as we have describ'd. Lastly, the greyish Colour of the inner Substance of the Kidneys, which is full of an Urinous or Aromatick Salt, shews that this is capable of giving a Colour to such Bodies as it abounds in, as in the cinereous Part of the Brain.

This Part is distinguish'd by a Multitude of Furrows, the use of which was unknown to the Ancients. *Aristotle* fancies they serv'd to make the Brain lighter; but if this were all the Design, Nature might have made it lesser. *Erasistratus* places the Understanding here, which is founded on the Variety of its *Anfractus*, which answers well enough to the Variety of its Thoughts. But this Imagination being founded more on Morality than Nature, I shall pass it by in this Place. It is more probable they serve to introduce the Vessels into the *Pia Mater* which goes to the bottom of these Furrows.

And since they are so many Pores, through which the Matter of the Spirits is convey'd into the Brain, those Animals which have most of these *Anfractus's* must have most Spirits, and by consequence most Sagacity, which chiefly depends on this subtil Liquor. To this Dr. *Willis's* Observations do agree. And as the Animal Functions in Men do require more Spirits than in Beasts, with much more Reason we may conclude, that those who have the fewest *Anfractus* have the least Wit, because they cannot so well exercise the chief Functions of the Soul, as those who have more. Where-

fore little Heads which have very few, and sharp-pointed Heads, which contain still less, because the cinereous Part is very small, being prest by this Figure which contracts it self above, are subject to Folly, which gives way to the Latin Proverb, *Cilones in insaniam prociues sunt* : And the Prince of the Greek Poets observes, That *Thersites* had his Soul as ill turn'd as his Body, painting him in these Terms, *φῶξας ἀμαρτόεπνα*.

We have insisted long on the Surface of the Brain. If we proceed a little further, and examine nearer the Cinereous Substance, we shall find that it is nothing more than an Aggregate of an Infinity of small Glands, which are more conspicuous when the Brain is thoroughly boil'd, than when it is raw and not boil'd at all. And as all the Glands which serve for Filtration, have a particular Vessel, into which they discharge their Liquor ; so the Glands of the Brain have each their particular excretory Tube, thro' which the Animal Spirit which they filter, is convey'd.

All these Tubes meeting in a *Fasciculus* or Bundle, make the *Corpus callosum*, which lies immediately under the Ash-colour'd Substance : They form also the Spinal Marrow and *Medulla oblongata*, which is seated under the *Corpus callosum*. So that the Brain may be justly compar'd to a bunch of Grapes. The Glands of the Cinereous Substance are the Grapes, the Medullary Tubes which arise from them, are the Stalks, which unite and end in one Stalk, and that is the *Medulla Oblongata*. The Tubes arising from these Glands,

Glands are thicker in the *Corpus callosum*, which is immediately beneath them, than in the *Medulla oblongata*, which is more distant. Nor can it be thought strange that this last is not so large as as the *Corpus callosum*, tho' it be an Aggregate of the same *Tubes* which compose both.

If we pursue these Medullary Channels, they will lead us to certain Cavities call'd the Ventricles of the Brain, which seem to be form'd by the Meeting of the two great Branches, which rising from the Trunk of the *Medulla oblongata*, or the Basis of the Brain form a sort of an Arbor. Their Figure resembling a Crescent, perhaps gave the Ancients occasion to fancy the Moon had the Government of the Brain. The Serosities with which most commonly they are fill'd, the situation of the *Infundibulum* in the middle of them, in which it serves as a Sink, and the *Glandula Pituitaria* directly beneath to receive what comes from them, seem to evince they are only Receptacles of the Superfluous Moisture of the Brain, and not the Laboratory of the Animal Spirits, which subtil Fluid must needs escape through the Arches of these Vaults, or the *Infundibulum*, or the Hole which answers to the *Crista Galli*.

These two Ventricles are divided by a Partition, which the *Latins* call *Septum lucidum*, by reason of its transparency. This Partition is fastened above in the Roof of the Ventricles, and below to the *Medulla oblongata* between two Eminences call'd *Corpora striata* or the channell'd Bodies, from the Furrows visible in them.

And as all Roofs have need of some Pillars or other Props to support them, so this of the Brain hath three, one of which is call'd the *Basis* of the Vault

Vault, which is seated between the *Thalami* [or Beds] of the Optick Nerves and these striate or channell'd Bodies. The two others are call'd the Arms of the Vault, because in effect they embrace the Thighs of the *Medulla oblongata*. These might with better Reason be call'd the Arches of the Vault, because these Arms bending a little towards the sides of the *Medulla oblongata*, form a Ridge with two Arches and three Pillars, which make the *Basis* of the Roof, and the two Extremities of its Arms which support themselves on the *Medulla oblongata*. The two Branches of this *Medulla* bear the Name of the Thighs, not only because they pretty much resemble those Parts in their Figure, but further because there are above them two Eminences which are like Buttocks. Between these two Parts there is a Hole which is call'd *Vulva*, because its Figure and Situation is not very unlike that Part. That call'd *Anus* has its Name too from its Figure and Situation, which is precisely between the Buttocks at the Entry into the third Ventricle.

The Thighs of the *Medulla oblongata* do not scind so well but that they leave behind them a Hole call'd *Infundibulum* or the Funnel, which terminates at the *Sella Turcica* on the *Glandula Pituitaria*, with which it is enchased there as in a Nich, and all enterlac'd with an Infinity of small Arteries which come from the Carotids; for it is by that way they enter into the Brain, their Branches joining with so many small Veins, compose that Contexture, which is call'd *Rete mirabile*. The Pituitary Gland is like a Sponge, which absorbs the superfluous Serosity which is contain'd in the Arteries of that *Plexus*, which

Man has no occasion for, his Blood not being so warty as that of Beasts.

The Veins of the *Rete Mirabile* which terminate likewise in the *Pituitary Gland* are charged with the Humidities which the *Infundibulum* is constantly pouring in, and which it receives from the Arteries which enter it on every side, and carries them into the Jugular Veins to make the Blood more fluid, which by the loss of its Spirits in passing through the Brain, was become thick; and this is the Cause too why the Trunk of the Lymphatick Vessels discharges its *Lympha* into the Axillary Veins, which are Ramifications of the Jugulars. The Injection of colour'd Liquors, which is made thro' the *Infundibulum*, and which appear in the Jugulars, will not suffer us to doubt that the Serosities of the Brain go thither.

For we must not believe that the Water which runs thro' the *Infundibulum*, passes thro' the *Os Sphenoides*, and discharges it self by the Palate into the Mouth; though the Water which Dr. *Willis* poured into the *Sella Turcica*, after he had remov'd the *Dura Mater* which lined it, the *Pituitary Gland*, and all the Vessels of the *Rete mirabile* (some of which fill the Holes of the *Os Sphenoides*) did distil into the Mouth, because he himself had made a Passage by removing the Vessels which fill the Holes, whereas in a living Animal, this Bone being lined with the *Dura Mater*, and its Holes fill'd, it is impossible that any Liquor should pass, as any one will find who shall please to make the Experiment. Pour Water, or any other subtil Liquor, as Spirit of Wine, into the *Sella Turcica*, and you will not find the least Drop go into the Mouth. For the better

better discoving the Pituitary Gland and the *Rete mirabile* you must free the *Dura Mater*, which adheres to the *Basis* of the Skull, beginning at the Entry of the Spinal Marrow, and continuing to the *Sella Turcica*. This cannot easily be done but in the Head of a Calf, because that other Animals, who have the Head less tender and moist, this Membrane cleaves more closely.

The Pituitary Gland is not only watered by the Serosities of the Anteriour Ventricles, but farther by those which come from the Cerebel by the fourth Ventricle, or that which flows from the *Nates* by the third. And this can scarcely be denied if we reflect, that from the fourth Ventricle quite to the *Infundibulum* there is a continued Valley, in which there was a Stream of Serosities, which passing under this part call'd *Varolius* his Bridge, seated under the *Glandula Pinealis*, goes and discharges it self into the *Infundibulum*, and thence into the Pituitary Gland.

But for fear this Rivulet should exceed its Bounds, and run over the Lateral Processes which bound its Channel to the Right and Left, and which are seated between the Brain and Cerebel, there is a Cloth spread over to hinder these Inundations. For the rest this Cloth cannot in any manner do the Office of a Valve, because it hinders neither Wind nor any other Liquor from passing from the third to the fourth Ventricle, nor from the fourth to third, as appears by the making of Injections. Besides that its two Ends are fastned to the Roof of these Ventricles, that is, to the Cerebel at the Head of the Vermicular Process, and on the sides of the *Nates* to the Edge of the Testicles, whereas to perform the Office

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of a Valve, it ought to have been fastned below.

For the more fully evincing the Truth of this there requires nothing more but to pass the Probe dextrously underneath, and to observe heedfully upon laying it open, whether it has made it self a Passage by leaving the soft Substance, or has follow'd the Road which Nature has traced; and if you have introduced as you ought, you will find it has made no Breach.

From what I have said I am perswaded that the third and fourth Ventricle, as well as the two antierour ones only serve to receive the Serosities of the Parts above them, very far from what *Bartolin* fancies, that they are the Place where the Animal Spirit is generated.

The third Ventricle arises from the Conjunction of the two Antierour ones by their Concave Surfaces. Both those half Sphæres and their Processes, which have the Shape and Name of Testicles, are only Productions of the *Medulla oblongata*.

In passing from the Eminences to the *Cerebellum* there are three sorts of *Apophyses* or *Processes*, viz. two Lateral lying all along the Marrow on its Edges. These are join'd by a middle Process, where the Pathetick Nerves take their Rise. All these Processes are on the *Medulla oblongata*, below which there are the Pyramidal and Anular Processes, which taking their Rise from the *Cerebellum*, like a Ring, embrace the *Medulla oblongata*.

These lateral Processes serve to keep a Communication between the Brain and *Cerebellum*, and convey the Undulation of the Spirits from one to the other; and perhaps the Course of one is from

from the Brain to the Cerebel, and the other is the Reverse of this, that two contrary Undulations at the same time may not hinder one another; and this is the Reason of their Duplicity.

The middle Process communicates to the Pathetick Nerves which arise from it, the Undulations which the Passions imprint on the Spirits, and which pass from the Cerebel to the Brain by the Lateral Processes. These Undulations of the Spirits being convey'd to the Muscles of the Eye, put them into several Motions proper to discover the Passions which cause them, as any one may discover in himself or another upon any Emotion of Mind, and from this they derive their Name.

The Pyramidal Processes, are the Receptacle of the Spirits which flow into the eighth Pair of Nerves, which assisting in the incessant Motions of the Lungs and Diaphragm, require a great stock of Spirits which are kept in these Processes.

In the last Place, the Annular Processes serve to keep a Communication between the Heart and the Brain, in such manner that all the Pathetick Undulations which are raised in the Spirits of the Heart, being conveyed to the Brain chiefly by the Nerves of the fifth and sixth Pair, pass through the Process in which these two Pair of Nerves terminate. For this Reason it is that Animals which are most passionate have these Processes larger than others, because the Spirits dilate them by passing often through them.

The Cerebel in which these Processes terminate, is formed by two Branches, which leaving the

the Sides of the Trunk of the *Medulla Oblongata* form a sort of *Arbor* above, meeting in the middle, and leave a Cavity, between which is accounted the *Fourth Ventricle*, which towards the Spine, ends in a Point like that of a Pen.

These Branches, as they recede from the Trunk, are divided into several lesser ones, which make a sort of a little Wood in the Substance of the *Cerebel*, whose Sides are easily divided into divers Pieces.

This Separation is made by the Help of a few large *Anfractus*. The small ones are more Numerous and Regular than those of the Brain, and form a Cortical Substance like so many Bowels, of which the *Corpus callosum* resembles the *Mesentery*.

The deepest *Anfractus* are in the *Middle Process*, which from its Figure is call'd the *Vermicular* one. It resembles a Ring which encompasses the *Cerebel*, or a Worm which bends back to bite its Tail.

It may be observ'd that the *Cerebel* in Men and Beasts, are very much alike, because the Vital and Natural Actions which depend on it, are perform'd in the same manner in one as in the other; Whereas there is a very considerable Difference between the Brains in Men and other Animals; because the sensitive Functions of this Part are very different.

I think the Opinion of those Men is too Metaphysical, who pretend, that the Furrows of the *Cerebel* ought to be Regular; because its Functions are all orderly, and that

that those of the Brain shou'd be irregular by reason of the various Modes it exerts its Operations.

The *Cerebel* and Brain are both plac'd and supported on the *Medulla Oblongata*; or rather they are only principal branches of this great Trunk, while the Nerves are lesser ones.

The *Olfactory Nerves* arise from its Anterior Extremity, or its two first Eminences, which are call'd the *Striate* or *Channell'd Bodies*.

The *Optick Nerves* come from these two Eminences which are in the anterior Bodies between the *Striate Bodies* and the *Nates*; and for this reason they are call'd the *Optick Beds*, or *Thalami Optici*.

The *Motory Nerves* of the Eye arise from that Place of the *Medulla Oblongata*, which lies between two Eminences, and the *Nates* or *Buttocks*.

The *Patheticks* spring from the middle Process, which joins the two Lateral ones, and is seated behind the *Testicles*.

The Fifth and Sixth Pair spring from the *Annular Processes*; the Seventh and Eighth Pair from the *Medulla Oblongata* under the *Cerebel*.

The Ninth, Tenth and Eleventh, take their Rise from the Extremity of the *Medulla Oblongata* beyond the *Cerebel*.

Lastly, all the other Nerves, which are very Numerous, arise from the same Marrow when included in the Bones of the Spine of the Back; and like Organs, is compos'd of a large

large Pipe and several small ones. The great Tube is the Spinal Marrow, and the small ones are the Nerves which come from it. The Animal Spirit which flows thro' it, is like the Air which fills these Organs, and the Soul is like the Organist which plays them, determining the Spirits sometimes into one Nerve, and at other times into another ; tho' often it has no share, the Exterieur Objects becoming then the Organist, and determining the Spirits in different Manners.

Tho' all Nerves arise from the Brain, yet it may be said it has none, because none is inserted into it. And therefore its proper Substance has no Sense, tho' it gives Sense to the whole Body, which shews the Falsity of that Axiom of the Schools, *That nothing can give what it has not.*

C H A P. XVIII.

Of the Method of Dissecting the Brain.

FOR the perfect View of all the Parts mention'd, I don't approve of making too deep Incisions into the Brain, reaching to its Ventricles, which is *Sylvius's* Way ; or making them beneath on the Sides of the *Medulla Oblongata*, as *Bartholine* teaches ; nor, of cutting the Brain Horizontally, as the most part of our Surgeons still do. Lastly, tho' *Dr. Willis's* Method be excellent, I wou'd not, like him

him, cut the two *Lateral Parietes* of the *Anterior Ventricles*, with the *Basis* of the Arch and the *Septum lucidum*, which cannot be demonstrated if we pursue these Steps: Nor wou'd I at first cut the Brain thro' the Middle, for a Reason I shall hereafter give.

I am perswaded that the more a Part can be unravel'd without cutting its Substance, the better its natural Structure may be discover'd, which otherwise is much alter'd by the Incisions made into it. Therefore I admit that when all the Parts are exactly laid bare as far as they can be without tearing their Substance, to see as it were the Outside of Nature, there be as many Incisions made as you please to view the Inside, one serves to discover the Form of the Part, and the other its Fabrick. If any one desires to know the Artifice of a Machine, he cannot take a better way than to run thro' the Jointings and Separations which the Workman has left between its Parts: so the Anatomist, who wou'd discover the Natural Machine of an Animal Body, cannot do better than to follow the Separation, which Nature has made, And this is the way that I have taken to demonstrate the Structure of the Brain.

After the Skull is neatly saw'd off all round without cutting the *Meninges*, and the Brain by this means is laid bare, I make an Incision with the Point of a Knife, and enter into the *Sinus* at their meeting, that is, at the lower End of the *Falx*, because they are largest there. Then introducing a Probe into each *Sinus*, I open the three upper ones, by cutting lengthways the Membrane which joins them; I follow the

Longitudinal to the *Crista Galli*, and the Lateral ones to the *Jugular Veins*, into which they discharge the Blood they carry.

By this, we see the *Jugular Veins* are considerably dilated, where they go out of the Head, and make each of them a sort of a Gulph, where the Blood stops in the precipitate Course of its Descent, for fear it should fall with too great Rapidity, and the Brain be too soon evacuated, and the Heart oppress'd with too great Abundance.

After this, I slit the *Dura Mater* from the Process of the *Ethmoidal Bone*, which is call'd *Crista Galli*, quite to the Beginning of the Spinal Marrow to the Right and the Left; and I cut the Lateral *Falces*, which lie in that Valley which separates the Brain from the *Cerebel*, in order to turn the Brain back.

For this purpose having cut the *Dura Mater*, which makes a Bridle before, and hinders the turning it back, I divide in the neatest manner I can the *Mamillary Processes* of the *Olfactory Nerves* which lie beneath. This Separation may be handsomely made with the End of the Handle of a Dressing-Knife, cutting finely with the Point the small Ligaments which tie these Bodies together.

After this, I make an Incision on the *Olfactory Nerves*, to lay open a considerable Cavity, which most commonly is fill'd with Serosities in Beasts which graze; because their Nourishment being moister than that of other Animals, their Brain is so in proportion likewise. This Water serves to abate the excessive strong Scent of some Plants which wou'd offend the tender Substance of the Brain,

Brain, as the Humours of the Eyes preserve the *Retina* from the violent striking of the Rays of the Sun.

Altho' the Cavity of the *O'factory Nerves* be not very sensible in Men; yet the yellow Water which Dr. *Willis* has seen flowing from the Nostrils of an Epileptick Woman who had the Ventricles of the Brain full, makes us conjecture, that there are one or more insensible Ways which bring to the Nostrils part of the Moisture of the Brain, which contribute to furnish Matter for the Snor.

This done, I finish with cutting the *Olfactory Nerves*, which I continue to separate gently from the *Basis* of the Brain quite to their Rise. Then the Brain begins to invert it self by its own Weight, if it have room to incline backwards, and discovers the *Optick Nerves*, which must be divested of the two Membranes, to shew how they are united in the Place where they enter the Cavity of the Skull, how they are separate again above, and the Difference of the Fibres which compose these two Nerves. In short, I follow them to the *Optick Eminences*, that is, to their Organ.

I do the same thing to all the other Nerves; and cutting all those Strings which tie the Brain to the Skull, I take it quite out of its Place. This Method of taking the Brain out of the Skull is good; but I shall shew another which is something more tedious, but is much better.

Having laid open the Artery of the Neck of an Animal, and made an Incision sufficient to receive the End of a Syringe; I make several

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Injections with a certain black Liquor, or rather with Wax melted and mix'd with Oil and Turpentine according to the Method of Mr. Swammerdam. This dextrous Anatomist has since found the way to do this with Quicksilver, which does it much better than Wax: because the Vessels fill'd with it are not so soon broken as the former. I continue these Injections till I find that the *Jugular Veins*, which I have also laid bare, are fill'd with it. Then I tie the Veins to stop the Liquor in the Brain, and view more commodiously the agreeable Ramification of the *Carotids*, and *Vertebral Arteries*, and the *Jugular Veins*, and the Communication of these three sorts of Vessels with one another.

To discover the Distribution of this Liquor in the Vessels of the Brain, I saw the Skull handsomly round; and having separated the *Dura Mater*, which lines it, I take the Cap which covers the Brain; after which, by the colour'd Injection, I trace the wonderful Distribution of the Vessels, and by the Help of this, find the Veins which empty themselves into the *Longitudinal Sinus*, and are inserted from before backwards in Beasts, and from behind forwards in Men.

Or to distinguish more easily and with one transient Glance of the Eye, the *Arteries* from the *Veins*, I begin with Injections into the *Jugular Vein*, having first evacuated the Blood, by pricking it with a Lancet, and ty'd the *Carotids*; and then I drive the Liquor forcibly with a Syringe to beat down the *Valves*, which might hinder the Distribution.

I tie the *Carotids* in the first place, because it wou'd be vain to let cut the Blood in the *Jugular*, if I did not hinder new Blood from being pour'd in continually by the Arteries. I evacuate the Vein, that the Injection may find a more easie Passage, and give a better Tincture. In the last place I begin these Injections rather thro' the Vein than the Artery; because if the Liquor shou'd be suppos'd to pass from the Artery into the Vein, they wou'd be fill'd with the same Liquor if I began the Injection thro' the Artery: Whereas on the contrary, if I first inject the Vein, not a Drop will pass into the Artery: And when the injected Wax is cold, if I then inject the Artery, it is plain nothing can pass out of it into the Vein, since that was fill'd with the former Injections.

And especially if this be done with Wax, which hardens immediately. The Syringe invented by *M. Swammerdam* (for the common ones will not serve) must be well heated, and the Injection made near a good Fire, while the Animal is yet alive; that the natural Heat of the Part may supply the Place of an Artificial one, which is procur'd by keeping the Part in warm Water; but there is no room to foment the Brain in this manner. Therefore it would be better to take it out if it could be done without breaking the Vessels of the *Dura Mater*, which adheres close to it; for then they might be heated with warm Water, which would hinder the Wax from congealing so soon.

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Thus the *Arteries* and *Veins* are easily distinguish'd by their different Colour; and you will see where the *Veins* are inserted into the *Sinus*. You will see at the same time that one *Carotid* has a Communication with the other, both of them with the *Vertebral Arteries*, since the Injection made into one *Carotid* will not only be imparted to the other, but likewise to the *Vertebral Arteries*.

According to this Method you must have a Care not to cut the *Dura Mater* till the Brain be taken out and all its Vessels examin'd, which are dispers'd thro' its Membranes, because this cannot be done without cutting some one of these Vessels, which shedding all their Liquor, would frustrate such an Injection. But the *Dura Mater* must be carefully separated from the other Bones as it was in that Part of the Skull which was taken off.

When in making this Separation, you come to the *Sella Turcica*, you must tie them to prevent the Effusion of the Liquor in them, and keep the other Arteries from emptying themselves. The same must be done to the *Jugular Veins* and the *Vertebral Arteries*, continuing till the *Dura Mater* be separated from the Bone and the Nerves, are cut, that you may take out the Brain.

Then you may see all the *Veins* and *Arteries* which water the upper and lower part of the Brain, and run curiously thro' it. Then I slit the *Dura Mater* under the *Medulla Oblongata* quite from the Olfactory Nerves to the Beginning of the Spinal Marrow, and separate it gently from the *Pia Mater*, to which it is ty'd

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by a number of small Vessels, bringing it to the sides of the Brain, and upwards towards the *Falx*, which must be carefully separated from the Brain without tearing any thing. For this purpose you must gently dilate the great Fold in which it lies, drawing it one ways and another, and cutting at the same time all the small Filaments which tie the *Falx*, or join both sides of the Folds together. You must continue to do this till you come to the Arch of the Brain, and then it will be easie to turn back the *Falx* together with the *Dura Mater* which covers the fore-part of the Brain quite to the *Torcular*; for if you should pull in this place, there would be danger of tearing of the fourth *Sinus*.

The Brain being thus stript I do the same thing to the Cerebel, turning back the *Dura Mater*, which covers it quite to the Concourse of the four *Sinus's*, and separating carefully, as well the Lateral *Falces* as the Longitudinal one, I raise that Membrane to the Right and the Left, gathering it at the Place of the *Torcular*, which I separate entirely from the Bodies which encompass it.

Then indeed you see the Brain naked, but you only see the outside of this Mansion of the Soul. For to contemplate its inside you must run through its four Chambers, and see what they contain. You must by Degrees invert the upper part of the Brain, or the Fore-Arch after it is well separated from the Cerebel. By this you discover in the first place that part of the *Medulla oblongata*, which lies between the Brain and the Cerebel, embraced by the Annular Protuberances,

ces, on the Edges of which lie the two Lateral Processes joined by the middle Process.

If you reverse the Brain a little farther, having a care of cutting the small Vessels which tie the upper part to the lower, you will see the Testicles and Nates or Buttocks. In proceeding to reverse it you will come insensibly to the Edge of the Anteriour Ventricles. There you will see two Arches of a Bridge form'd by the Arches of the Roof, and supported by three Pillars, two of which are on one side, and the other in the middle. This last is called the *Basis* of the Roof, and the two other are the Extremities of its Arms, which are supported in the *Medulla oblongata*. Under this Bridge there runs a Torrent of Serosities, which coming from the third and fourth Ventricle throws it self into the *Infundibulum*, passing first under this Bridge of *Varolius*, which is at the Issue of the Ventricle, coming from before backwards.

After this I blew with a Tube under the Arms of the Roof, and the Anteriour Ventricles are very much distended. In the mean time I put two Probes over the Arches of the Vault, to raise them on both sides. By means of this you may very well see the inside of the Ventricles. The two *Plexus Choroides* which are seated between the striate Bodies and the Optick Eminence, leaving the former before towards the Anteriour Extremity of the Ventricles, and the latter, and the Optick Eminences behind towards the Posterious one. You see likewise the *Septum lucidum*, in which a slight Incision discovers a small Cavity, which some think to be the Seat of the Soul. There are some Anatomists who make the Incision on the

side of the *Septum* ; but I make it on the Roof descending till I come to the Caviry, or I blow gently with a Pipe into the Hole I have made.

In passing thus from the Brain to the Anterior Ventricle, I follow the fourth *Sinus* or *Torcular*, and I find it makes a *Plexus* on the *Glandula Pinealis*, to which it cleaves very close, and that forking it self into two parts, in its Progress it makes part of the *Plexus Choroides*,

To return to the *Glandula Pinealis*, I separate it together with the *Medulla oblongata* to which it is only contiguous, as you may find if you take Pains to cut the Ties.

This Gland is at the entry of the third Ventricle, into which I introduce a Probe through the Hole call'd the *Anus*, and above *Varolius* his Bridge, or through the Hole call'd *Vulva*, and above the same Bridge, for these are both Parts which lead into the same Ventricle. The Probe which is introduc'd, goes out beyond the Cerebel above the *Medulla oblongata*, without hurting the Substance of the Brain, as appears plainly enough if you open the third and fourth Ventricle, to see if the Probe has not forc'd a way by making a Breach through this soft Substance.

But the Communication of the third and fourth Ventricle is manifest without opening them or introducing a Probe, only by blowing with a Tube thro' the *Anus*, for then you will see that true Cloth which covers the *Medulla oblongata* between the Brain and the Cerebel to swell considerably, and you will perceive the Breath beneath the Cerebel if you put your Hand there, because the Cloth which I mention'd hinders it from

from going out between the Testicles and the Cerebel. If you suspect the subtilty of the Breath might make a way where Nature has not form'd any, make Injections, and you will find the Liquor will come out beyond the Cerebel above the *Medulla oblongata*.

I you blow behind the Brain, or make Injections there, forcing towardt the third Ventricle, you will see the same Cloth distended, and you will feel the Wind if you put your Hand before the *Anus* or the *Vulva*, or you will see the Liquor with which you make the Injections run thro' these two Holes.

Lastly, for the better understanding the extent of this, and seeing at the same time the inside of the Cerebel, I separate it well from the *Medulla oblongata*, by cutting all the Vessels or Filaments which tie it down. Then inverting the *Cerebel* forwards, I see perfectly the fourth Ventricle, resembling in its Figure a Pen pointing backwards.

I discover at the same time the two ends of the Vermicular Process, the Head and the Tail, which are hid under the Cerebel, and a little beyond the Anterior, and I see the place where this Tent is fastned to the Roof of the Cerebel, by reversing it a little on the side; but as long as the Parts may be seen without Incision, I believe it is best to omit it.

The two Pillars of the Roof of the Cerebel, the Regularity of the Furrows, and the upper Semicircle of the Vermicular Process are seen without any Operation as soon as the *Dura Mater* which cover'd the Cerebel is removed. But to find the depth of these *Anfractus*, you need only dilate them

with the end of the Handle of your Dissecting Knife, which must be made flat like a *Spatula*, and cut at the same time the Filaments which tie together the two sides of these Folds, and you will find that they penetrate to the Callous Substance as well as in the Brain, on which you must make the same Operation to follow its Furrows.

All the Extremity Part of the *Medulla oblongata* may be seen without any other Operation than what is here described.

Thus I demonstrate the Machine of the Brain to shew its Form; next, to know its Matter, I let it seeth for some time in a Pot of Water with the Spinal Marrow, which I have taken out of its Sheath, till the one and the other be half boil'd. Then taking them from the Fire and leaving them to cool, I begin to separate the Filaments of the Spinal Marrow, which is nothing more than a pretty large Bundle of small Nerves, which way is traced by one who is dextrous, to the Brain, and its Gray Substance where they all end.

At the end of each of these Filaments or Nervous Tubes there is a small Gland. This forms the Animal Spirit by filtering the most subtil part of the Blood, and this small Tube is plac'd beneath it to receive this Spirit and distribute it. Between the small Filaments which compose the Brain, there is a soft Medullary Substance, which chiefly appears in the striate Bodies.

Some of these Filaments which compose the Spinal Marrow end in the Brain, and others in the Cerebel. The Superiour terminate in the latter, and the Inferiour and Middle ones in the Former. When you have done dividing the Spinal

nal Marrow, the *Medulla oblongata* and the Cal-
lous Body, you will find these three Bodies are no
more than a Collection of these Filaments, as
well in the Cerebel as the Brain, and because
they are larger in the Callous Body than the *Me-
dulla oblongata*, and their Interstices are larger, and
fuller of a Medullary Substance : It must not be
thought strange that the *Medulla oblongata* is slen-
derer than the Callous Body, though both are
no more than a Collection of the same Fila-
ments.

I am very much inclin'd to believe (pardon the
Digression) that the Serosities which run into the
Ventricles are separated through this Medullary
Substance : For it is not probable there should be
the same Filter in the Brain for Spirit and Phlegm;
since the Rectification of the one only consists in
the separation of these two Substances.

Lastly. In pursuing these Filaments to their In-
sertion in the Glands of the Cinereous part, one
may observe the wonderful Ramification they
make in the Cerebel. You will see it still bet-
ter if you cut the Brain from before backward
with a very sharp Razor.

This Incision is not to be made before you ex-
amine that fine Contexture which covers the *Me-
dulla oblongata* between the Brain and Cerebel, be-
cause being fastned to the Roof of this, it is quite
torn, and you cannot see its Origine.

When you have traced all these Filaments to
the striate Bodies, you will find them thicker,
and separated by larger Medullary Interstices
which form these Furrows or Channellings,
whence they take their Name. You will more
readily and better discover these, by making a

very superficial Incision on these Eminences, and scraping away with the back of the Knife the Ash-coloured Substance which hides them. I will not stand to confute the Opinion of those who say these Channels are Artificial; because if you do not make your Incision after a certain manner they do not appear; for the same Reason would prove, that the Structure of every part is Artificial too, because it would not appear without laying it open after a certain manner.

After having traced the Nervous Filaments quite to the Ash-coloured Substance of the Brain, you will see it is nothing more than a Collection of a certain Number of Glands ranged orderly by one another.

This is the way I take to discover the Form and Matter of the Brain. It is a little tedious, I confess, and requires a great deal of Care, but it is also very good, and gives great Satisfaction.

After a profound Admiration of the Divine Structure of the Creator, I am assur'd you will not be of the Opinion of the Philosopher who ascribes no other Use to it but to cool the Heart. For besides the great distance, which must render it incapable of such an Office (especially according to the Opinion of the Philosopher who was ignorant of the Circulation) the most subtil Blood, which is raised to the Head, the Volatil Salts which are sublimed in abundance as to the Head of a natural Alembick, the great number of Vessels from which it receives a constant Heat, like a *Balneum Mariæ*, and the great quantity of Spirits with which it abounds, induce me think the Brain is more hot than cold.

It seems to be the Principal Organ of all Animal Actions. Though a certain Woman found her Child stir briskly in her Womb, was born without a Brain. For there is ground to believe it might have these Motions before the Brain was disclosed by any Caustick Liquor which had corroded and blacken'd the internal Surface of the Skull, and before it ran through the great Hole of the Occiput, which this violent Corrosive had probably penetrated, leaving a black Spot where it passed.

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T R E A T I S E
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*Straps, Swathing-Bands, Bandages,
Bolsters, Splints, Tents, Vesicato-
ries, Setons, Cauteries, Leeches, Cup-
ping-Glasses, and Phlebotomy.*

C H A P. XIX.

*Of Straps, Swathing-Bands, Bandages,
and Bolsters.*

WHAT is a Strap?

It is a kind of Band commonly made use of for the Extension of Members in the reducing of Fractures and Luxations; or else in binding Patients, when it is necessary to confine them, for the more secure performing of some painful Operation: These sorts of Ligatures have different Names, according to their several

several Uses, and often bear that of their Inventer.

What is the Matter whereof these Straps are compos'd ?

They may be of divers sorts, but are usually made of Silk, Wool, or Leather.

What is a Swathing-band ?

It is a long and broad Band, that serves to wrap up and contain any Part with the Surgeons Dressings or Preparatives.

Of what Matter are these Swathing-bands made ?

They are made at present of Linnen Cloth, but in the time of Hippocrates, were made of Leather or Woollen Stuff.

How many sorts of Swathing-Bands are there in general ?

There are two sorts, viz. the Simple and Compound ; the former are those that are smooth, having only two ends ; and the others are those which are trimm'd with Wool, Cotton, or Felt, or that have many Heads, that is to say, Ends, fasten'd or cut in divers places, according as different Occasions require.

What are the Conditions requisite in the Linnen Cloth whereof the Swathing-bands are made ?

It must be clean, and half worn out, not having any manner of Hem or Lift.

What are the Names of the different Swathing-Bands ?

There are innumerable, of but the greater part of them take their Denominations from their Figure or Shape ; as the Long, Streight, Triangular, and those which have many Heads, or are trimm'd.

What

What is a Bandage ?

It is the Application of a Swathe, Roller, or Riller to any Part,

How many sorts of Bandages are there ?

As many as there are different Parts to be bound ; some of them being Simple, and others Compound : The former are those that are made with an uniform Band ; as the Circular, that with Edgings, the Spiral, the Reversed, and divers other sorts : The Compound are those that consist of many Bands set one upon another, or sew'd together ; or else those that have many Heads. They have also particular Names taken from the Inventers of them, or from their Effect ; as *Expulsive* Bandages to drive back, *Attractive* to draw forward, *Contentive*, to contain, *Retentive* to restrain, *Divulsive* to remove, *Agglutinative*, to rejoin, &c.

There are others whereto certain peculiar Names are appropriated ; as *Bridles* for the lower Jaw, *Slings* for the Chin, the back part of the Head, Shoulder, and *Perineum* ; *Scapularies* for the Body, after the manner of the *Scapularies* of Monks ; *Trusses* for Ruptures ; *Stirrups* for the Ankle-bones of the Feet, in letting Blood, and upon other Occasions. Lastly, there are an infinite number of Bandages, the Structure whereof is learnt by Practice, and observing the Methods of able Surgeons, who invent them daily, according to their several Manners ; and the first *Idea's* of these can only be taken in reading Authors that have treated of them.

What are the general Conditions to be observed in the Bandages ?

There

There are many, viz: 1. Care must be taken that the Bands be roll'd firm, and that they be not too streight nor too loose. 2. They are to be united from time to time in Fractures; they must also be taken away every three or four Days, to be refitted. 3. They must be neatly and conveniently roll'd, that the Patient may not be uneasy or disquieted.

What ought to be observed in fitting the Bolsters?

Care must be taken to make them even soft, and proportionable to the bigness of the Part affected; to trim them most in the uneven places, that the Bands may be better roll'd over them, and to keep them continually moisten'd with some Liquor proper for the Disease, as well as the Bands.

A
TREATISE
OF
Chirurgical Diseases.

CHAP. I.

*Of Tumours in general, Abscesses, or Im-
posthumes, Breakings out, Pustules,
and Tubercles.*

WHAT is a Tumour?

A Tumour is a Rising or Swelling rais'd
in some part of the Body by a settling of
Humours.

How is this settling of Humours produc'd?

Two several ways, viz. by Fluxion and Con-
gestion.

What is the settling by Fluxion?

It

It is that which raiseth a Tumour all at once, or in a very little space of time, by the Fluidity of the Matter.

What is the settling by Congestion?

It is that which produceth the Tumour by little and little, and almost insensibly, by reason of the slow Progress and Thickness of the Matter.

Which are the most dangerous Tumours, those that arise from Fluxion, or those that derive their Original from Congestion?

Those that proceed from Congestion, because their thick and gross Matter always renders 'em obstinate, and difficult to be cur'd.

Whence do the differences of Tumours proceed?

They are taken, first, from the natural Humours, *Simple, Mixt and Alter'd*: *Simple*, as the *Phlegmon*, which is made of Blood, and the *Erysipelas* of Choler: *Mixt*, as the *Erysipelatous Phlegmon*, which consists of Blood mingl'd with a Portion of Choler; or the *Phlegmonous Erysipelas*, which proceeds from Choler intermixt with a Portion of Blood: *Alter'd*, as the *Meliceris*, which is compos'd of many Humours, that cannot be any longer distinguish'd by reason of their too great Alteration. Secondly, the Difference of Tumours is taken from their likeness to some other thing, as the *Carbuncle* and the *Talpa*, the former resembling a burning Coal, and the other a *Mole*, according to the Erymology of their *Latin Names*. Thirdly, From the Parts wherein they are situated; as the *Ophthalmia* in the Eyes, and the *Quinsy* in the Throat. Fourthly, From the Disease that causeth 'em, as *Venereal* and *Pe-tilential Buboes*. Fifthly, From certain Qualities found in some, and not in others; as the *Encysted*

encysted Tumours, which have their Matter inclos'd within their proper *Cysts*, or such as are contain'd in a Bag, or Membranes; and so of many others.

How many kinds of Tumours are there that comprehend at once all the particular Species?

There are four in Number, viz. the *Natural Tumours*, the *Encysted*, the *Critical* and the *Malignant*.

What are natural Tumours?

They are those that are made of the four Humours contain'd in the Mass of the Blood, or else of many at once intermixt together.

What are the four Humours contain'd in the Mass of Blood?

They are Blood, Choler, Phlegm and Melancholy, every one whereof produceth its Particular Tumour: Thus the Blood produces the *Phlegmon*, Choler the *Erysipelas*, Phlegm the *Oedema*, and Melancholy the *Scirrhus*. The Mixture of these is in like manner the Cause of the *Erysipelutous Phlegmon*, the *Oedematous Phlegmon* or *Phlegmonous Erysipelas*, and the *Phlegmunous Oedema*, according to the quality of the Humours, which are predominant, from whence the several Tumours take their Names.

What are the Encysted Tumours?

They are those, the Matter whereof is contain'd in certain *Cysts*, or Membranous Bags; as the *Meliceris*, and the *Struma* or Kings-Evil.

What are Critical Tumours?

They are those that appear all at once in acute Diseases, and terminate them with good or bad Success.

What are Malignant Tumours?

They

They are those that are always accompany'd with extraordinary and dreadful Symptoms, and whose Consequences are also very dangerous; as the Carbuncle in the Plague.

What are Impostumes or Abscesses, Breakings out and Pustules?

Indeed it may be affirm'd, that all these kinds of Tumours scarce differ one from another, except in their size or bigness: nevertheless, to speak properly, by the Names of Impostumes or Abscesses, are understood gross Tumours that are suppurable, or may be dissolv'd, and by those of Breakings out and Pustules, only simple Pustles, Wheals, or small Tumours, that appear in great Numbers, and which frequently do not come to Suppuration; some of them consisting of very few Humours, and others altogether of a dry Matter.

What difference is there between a Tumour and an Impostume or Abscess?

They differ in this particular, that all Tumours are not Impostumes nor Abscesses; but there is no Impostume nor Abscess that is not a Tumour: As for Example, Wens and Ganglions are Tumours, yet are not Abscesses nor Impostumes; whereas these last are always Tumours, in regard they cause Bunches and Elevations.

CHAP. II.

Of the general Method to be observed in the curing of Tumours.

WHAT ought a Surgeon chiefly to observe in Tumours, before he undertake their Cure?

He ought to know three things, viz. 1. The Nature or Quality of the Tumour. 2. The time of its Formation. And 3. Its Situation: The Quality of the Tumour is to be known, because the Natural one is otherwise handl'd than that which is *Encysted, Critical* and *Malignant*. As for the time of its Formation, it is four-fold, viz. the Beginning, Increase, State and Declination, wherein altogether different Remedies are to be apply'd. The Situation of the Tumour must be also observ'd, because the Dressing and Opening of it ought to be as exact as is possible, to avoid the meeting with an Artery or neighbouring Tendon.

How many ways are all the Tumours that are curable, terminated?

They are terminated after two manners, viz. either by dissolving 'em, or by Suppuration.

Are not the Scirrhus and the Ecthyma or Gangrene, two means that sometimes serve to terminate and cure Impostumes?

Yes; but it is done imperfectly, in regard that a Tumour or Impostume cannot be said to be absolutely cur'd, as long as there remains any thing of the Original Malady, as it happens in the

the *Scirrhus*, where the Matter is harden'd by an imperfect dissolving of it, or when the Impostume degenerates into a greater and more dangerous Distemper, as it appears in the *Esthiomenus* or *Gangrene* that succeeds it.

Which is the most effectual means of curing Impostumes, that of dissolving, or that of bringing 'em to Suppuration?

That of dissolving them is without doubt the most successful, and that which ought to be us'd as much as is possible; nevertheless some Cases are to be excepted, wherein the Tumours or Abscesses are Critical and Malignant: for then the way of Suppuration is not only preferable, but must also be procur'd by all sorts of means, even by opening; which may be done upon this occasion, without waiting for their perfect Maturity.

What are the Precautions whereto a Surgeon ought to have regard before he undertake the opening of Tumours?

He must take care to avoid cutting the Fibres of the Muscles, and in great Abscesses of discharging the corrupt Matter all at once, to prevent the Patient's falling into a Swoon.

Ought the opening of Tumours always to be made longitudinally, and according to the direct Course of the Fibres?

No, it is sometimes necessary to open them with a Crucial Incision, when they are large, or when a *Cystis* or Membranous Vehicle is to be extirpated.

How many sorts of Matter are there that issue forth in the Suppuration of Tumours?

There

There are four sorts, *viz.* Pus, Ichor, Sanies, and Virus.

What is Pus?

It is a thick Matter, and white as Milk.

What is Ichor?

It is a thick Matter like the Pus, but of divers Colours.

What is Sanies?

It is a watery Matter that riseth up in Ulcers, almost after the same manner as the Sap in Trees.

What is Virus?

It is a kind of watery Matter, being whitish yellowish, and greenish at the same time; which issueth out of Ulcers, very much stinking, and is endu'd with corrosive and malignant Qualities.

How many general Causes are there of Tumours?

There are three, *viz.* the Primitive the Antecedent, and the Conjunct: The Primitive is that which gives Occasion to the Tumour: As for Example, a Fall or a Blow receiv'd. The Antecedent is that which supplies it with Matter, such is the Mass of Blood that thickens and maintains the Phlegmon. Lastly, the Conjunct Cause is the overflowing Blood or Matter, which immediately forms the Tumor.

What regard ought to be had to these three sorts of Causes in the Cure?

The Primitive Cause may be prevented by avoiding the Falls, Blows, or other Hurts, and the Antecedent by diminishing the Plethory of the Blood, and cooling the whole Mass by Phlebotomy. The Conjunct Cause, which is the overflowing of the Blood, may be also remov'd in dispersing it by dissolving, or else in discharging it by Suppuration.

What

What is a Crysis?

It is a sudden settling of Humours, which happens in Diseases, whereby they are usually terminated.

How are these critical Settlings effected?

By the Strength of Nature, which either expels the peccant Humours by the *Anus, Bladder, &c.* or carries them into the Habit of the Body; for in the former she causeth Fluxes of Humours, Urine and Blood, as in the other she excites Sweatings, Tumours, and even a Gangrene it self.

In what Parts do the Critical Tumours usually arise?

In the *Glandules*, which the Ancients call'd the *Emunctories* of the Brain, Heart and Liver; for they gave the Name of *Emunctories* of the Brain to the thick *Glandules* which lie under the Ears, that of the *Emunctories* of the Heart to those that are under the Arm-pits; and that of the *Emunctories* of the Liver, to those under the Groin. Now Malignant Tumours may arise in all these Parts, but the Venereal happen only in the Groin.

C H A P. III.

Of Natural Tumours.

A R T I C L E I.

Of the Phlegmon and its Dependencies.

WHAT is a Phlegmon?

It is a red Tumour occasion'd by the Blood diffus'd in some Part, wherein it causeth Extension, Pain and Heat with Pulsation.

Are Aneurisms and Varices which are Tumours made by the Blood, to be reckon'd among the Phlegmons?

No, because the Blood that forms the *Aneurisms* and *Varices* is not extravasated nor accompany'd with Inflammation, but only a Tumour of Blood proceeding from the Dilatation of the Arteries and Veins.

May Echymoses or Contusions consisting of extravasated Blood be esteem'd as Phlegmons?

By no means, in regard that it is not sufficient that the Blood be extravasated for the producing of a *Phlegmon*; it must also cause Pain, Heat, and a beating with Inflammation, which is not to be found in the *Echymoses*, except in great ones, after they have been neglected for a long time; where the corrupted Blood ought to be let out immediately,

diately, to prevent the Inflammation, overmuch Suppuration, and many other ill Consequences.

Is the Phlegmon always compos'd of pure Blood?

No, it may happen sometimes to partake of Choler, Phlegm, or Melancholy; on which account it is nam'd an *Erysipelatous*, *Oedomatous*, or *Schirrous Phlegmon*, always retaining the Name of the predominant Humour, which is the Blood; and so of the others.

R E M E D I E S.

What are the Remedies proper for a Phlegmon?

They are of two sorts, *viz.* General and Particular; the former having regard to the antecedent Cause, and the other to the conjunct. The *Phlegmon* is cur'd in its antecedent Cause, by Phlebotomy or letting Blood, by good Diet, and sometimes by Purgations; by which means the Plethory, Heat, and Alteration of the Blood is diminished: But Fomentations, Cataplasms and Plaisters facilitate the Cure in the conjunct Cause, either by dissolving the Tumour, or bringing it to Suppuration.

At what time is the opening of a Vein necessary?

In the beginning and Increase.

What are the Remedies proper to be used immediately upon the first appearing of the Tumour?

They are Resolvents and Anodynes; as Chervil boil'd in Whey, adding a little Saffron, to wash the Tumour, lay on Linnen Clothes soak'd in this Decoction, removing them often, and applying the Chervil with them.

Or

Or else take the Urine of a healthful Person, wherein is boil'd an Ounce of Sulphur for each Glass, and hath the Tumour with it.

The Sperm of Frogs is also made use of to very good purpose, either alone, or with Lime Water and Soap mixt together; or Oak Leaves and Plantane beaten small, and apply'd. But Care must be more especially taken to avoid cooling Medicines, Oils, and Grease, which are pernicious in great Inflammations.

What ought to be done in the increase of the Tumour and Pain?

They are to be asswaged by mollifying and dissolving Medicines; to which end a Cataplasm or Pultis is to be made with the Leaves of Elder, Wallwort, or Dwarf-Elder, Mallows, Violet-Plants, Camomile, and Melilot; whereto is added beaten Line-feed; causing the whole Mass to be boil'd in Whey, and allowing to every Pint, or thereabout, a Yolk of an Egg, twenty Grains of Saffron, a quarter of a Pound of Honey, and the Crumb of White-bread, till it comes to a necessary Consistence. Or else take Cow's Dung instead of the abovementioned Herbs, and mix with it all the other Ingredients, to make a Cataplasm, which must be renew'd at least every twelve Hours.

What is to be done in this State?

If the Tumour cannot be dissolv'd (as was intended) it must be brought to Suppuration by Cataplasms, consisting of these Ingredients, viz. Garlick, Roots of White Lillies roasted under Embers, Milk, and *Unguentum Basilicon*,

Or else only take a Glass of Milk, in which an Ounce of Soap is dissolv'd, to wet the Lin-

nen apply'd to the Tumour; and let it be often reiterated: Otherwise make use of Sorrel boil'd with fresh Butter, and a little Leaven or Yeast. The Plaister *Diafulphuris* is also most excellent either alone, or, if you please, mixt with *Diachylon* and *Basilicon*.

What is to be done in the Declination after the Suppuration?

The Ulcer must be at first gently dry'd with a Plaister of *Diafulphuris* or *Diachylon*, and afterward that of *Diapalma* may be us'd, and Ceruse or White Lead.

What Method is to be observ'd in case there be any Disposition toward a Gangrene?

It is requisite during the great Inflammation to make use of good Vinegar, in an Ounce whereof is dissolv'd a Dram of White Vitriol, with as much *Sol Ammoniack*, to bathe the Tumour: Or else take the Tincture of Myrrh and Aloes, with a little *Unguentum Egyptiacum*, and afterward make a Digestive of Turpentine, the Yolk of an Egg, and Honey, mingling it with a little Spirit of Wine, or Brandy, if there remains any Putrifaction or Rottenness.

Remedies for Aneurisms and Varices.

What is to be done in order to cure an Aneurism?

When it is little, as that which happens after an Operation of Phlebotomy or letting Blood ill perform'd, it may be sufficient to lay upon the affected Part a thin Plate of Lead, or else a Piece of Money or Counter wrapt up in a Bolster, and to bind it on very streight: But a
 Piece

Piece of Paper chew'd is much better for that purpose.

If the *Aneurism* be considerable, an Astringent Plaister may be us'd, such as the following.

Take *Bolus*, Dragon's Blood, Frankincence, Aloes, and *Hypocystis*, of each a Dram; mingle the whole with two beaten Eggs, and add Wax to give it the consistence of a Plaister, which may be apply'd alone, or mixt with an equal Portion of *Emplastrum contra Rupturam*, always making a small Bandage to keep it on. *Emplastrum de Cicuta* hath also a wonderful effect.

When the *Aneurism* is excessive, it is absolutely necessary to proceed to a Manual Operation, the manner whereof shall be shewn hereafter in the Treatise of great Operations.

What is requisite to be done in the Varices?

Varices are not generally dangerous, but even conduce to the Preservation of Health; nevertheless, if they become troublesome by reason of their greatness, and the Pains that accompany 'em, they may be mollified with the following Remedy.

Take the Mucilages of the Seeds of *Psyllium* and Line, of each two Ounces; of *Populeon* two Ounces; *Oleum Lumbricorum* & *Hyperici*, of each one Ounce; and of the Meal of Wheat one Ounce, adding Wax to make the Consistence of a Plaister; part of which spread upon Linnen or Leather, must be apply'd to the *Varix*, and bound on with a small Band.

If the Blood abound too much, it may be discharg'd by the Application of Leeches, or by a Puncture made with a Lancet: Afterward lay upon the Part a piece of Lead sow'd up in a Cloth,

and let it be kept close with a proper Bandage. Otherwise you may make use of an Astringent, such as this.

Take a Pomegranate, cut it in pieces, and boil it with as much Salt as may be taken up with the Tip of your Fingers, in a Gallon of strong Vinegar; then dip a Sponge in this Vinegar, apply it to the *Varix*, bind it on, and continue the use of it twice a Day for a Month together.

Remedies for Echymoses, Contusions, or Bruises.

How are Echymoses to be treated?

All possible means must be us'd to dissolve 'em, by laying Slices of raw Beef upon the Part, renewing 'em very often, or applying Linnen Rags dipt in Spirit of Wine impregnated with Saffron.

They may be also dissolved with the Roots of Briony rasped and apply'd thereto, or else with Plaister or Mortar, Soot, Oil of Olives and *Unguentum Divinum*, a Mixture whereof being made, is to be put between two Rags, and laid upon the Tumour or Swelling.

If the *Echymosis* happens in a nervous Part, Balsam of Peru may be us'd, or, for want thereof, *Oleum Lumbricorum* & *Hyperici*, with lukewarm Wine, with which the Compresses must be soak'd to be laid upon it.

When the *Echymosis* is great, and much Blood is diffus'd between the Skin and the Flesh, the safest way is to make an Opening to let it out, lest a too plentiful and dangerous Suppuration should ensue, or even a Gangrene it self. However,

ver, a Surgeon ought to proceed in the curing of an *Echymosis* in the Face with great Circumspection, which must be always prepar'd for Incision.

Of Phlegmonous Tumours or Imposthumes, and of Remedies proper for 'em.

What are the Tumours or Imposthumes that partake of a Phlegmon?

They are the *Bubo*, *Carbuncle*, *Anthrax*, *Furunculus*, *Phyma*, *Phygeton*, *Panaritium* or *Paronychia*, *Burn*, *Gangrene*, and *Kibe* or *Chilblain*.

What is a Bubo?

A *Bubo* is a Tumour which ariseth in the Groin, being accompanied with Heat, Pain, Hardness, and sometimes a Fever.

What is a Carbuncle?

A Carbuncle is a hard Swelling, red, burning, and inseparable from a Fever: It is coloured with a black Crust or Scab, that afterward falls off at the Suppuration, leaving a deep and dangerous Ulcer, and which sometimes doth not suppurate at all.

What is an Anthrax.

The *Anthrax* is very near the same thing as the Carbuncle, only with this difference, that the latter always appears in the Glandulous Parts, and the *Anthrax* every where else.

What is a Furunculus?

It is a kind of Boil, or benign Carbuncle, which somewhat resembles the Head of a Nail, and is on that account call'd *Clou* by the French,

causing Pains, as if a Nail were driven into the Flesh.

What is a Phygeton?

The *Phygeton* is a small, red, and inflam'd Extruberance, situated in the Miliary Glandules of the Skin, where it causeth a pricking Pain, without Suppuration.

What is a Phyma?

The *Phyma* appears after the same manner as the *Phygeton*, and suppurates.

What are the Remedies proper for all these sorts of phlegmonous Tumours and Imposthumes?

They are Cataplasms and Plaisters Anodyn, Emollient, Resolvent, and Suppurative, which are us'd proportionably as in the *Phlegmons*.

What is a Gangrene, Sphacelus, or Esthiomenus?

The *Gangrene* and *Sphacelus* signifie the same thing, nevertheless are commonly distinguish'd; the former being a Mortification begun, and the *Sphacelus* an entire or perfect Mortification; call'd also *Necrosis* and *Sideratio*. An *Esthiomenus* is a Disposition to Mortification, discover'd by the softness of the Part; and a *Gangrene* is defin'd to be a Mortification of a Part, occasion'd by the Interception of the Spirits, and the Privation of the natural Heat.

What are the Causes of a Gangrene in general?

Every thing that hinder the natural Heat from exerting it self in a Part; as strong Ligatures, astringent or resolvent Medicines, not conveniently us'd in great Inflammations, a violent Hæmorrhage, or Old Age, whereby the Spirits are exhausted; the bitings of Mad Dogs; excessive Cold, &c.

By what Signs is the Gangrene known?

It is discover'd by the livid Colour of the Skin which departs from the Flesh, the softness, coldness, and insensibility of the Part ; and sometimes by its dryness and blackness, from whence exhales a cadaverous Stench, with *Sanies* issuing forth after Punctures or Scarifications made therein. Lastly, a Gangrene is perceiv'd by the cold Sweats, Swoonings, *Syncope's*, and *Delirium's* that invade the Patient, and which are all the Fore-runners of approaching Death.

Is a Gangrene only found in the Flesh, and soft Parts of the Body ?

It happens also in the Bones, and is then call'd *Caries*.

How is this Caries or Gangrene of the Bone discover'd, when it lies hid under the Flesh ?

It is known by the black Colour of the Neighbouring Flesh, the Stink of the *Sanies* that comes away, the intolerable Pains felt thereabouts, which are fix'd and continual before the Imposthume and Ulcer appear ; but when the Ulcer is made, a kind of roughness may be perceiv'd in the Bone.

REMEDIES.

What are the Remedies proper for a Gangrene ?

They are those that take away the mortified and corrupt Parts, and recal the natural Heat ; both which Indications are exactly answer'd in the Extirpation of what is already corrupted, with the Knife ; and the Restauration of the natural Heat by the following Remedies.

Take an Ounce of good Vinegar, steeping therein a Dram of White Vitriol, with as much *Sal Ammoniack*: Let it be us'd in bathing the Part; and apply thereto Compresses well soak'd in the same Liquor. This Remedy is convenient in the first Disposition toward a Gangrene: Or, if you please, you may make use of the Yellow Water, which is made with Corrosive Sublimate and Lime-Water; taking, for Example, half a Dram of Corrosive Sublimate to be infus'd in a Pint of Lime-Water.

But a Tincture of Myrrh and Aloes is more efficacious, wherein *Unguentum Egyptiacum* is steep'd, or else Lime-Water kept for that purpose, in which have been boild two Ounces of Sulphur or Brimstone, with two Drams of *Mercurius Dulcis*; adding four Ounces of Spirit of Wine. This makes an excellent *Phegedonick Water*, with which the Part may be bathed, and the Compresses soak'd.

If the Gangrene passeth to the Bone, the Ulcer must be immediately cleans'd with Brandy, and *Euphorbium* afterward put into it, laying also some upon the Compresses, and abstaining from all sorts of Oily and Greasy Medicines. But if these Remedies prove unprofitable, recourse is then to be had to the Knife, Fire, or Amputation; the manner of performing which several Operations, is explain'd hereafter.

What are Kibes or Chilblains?

They are painful Tumours, which are often accompanied with Inflammation; they happen more especially in the nervous and outward Parts, as the Heel, and are so much the more

sensibly

sensibly felt, as the Air and Cold are more sharp and vehement.

What is to be done in order to cure these Kibes or Chilblains?

The Heel or affected Part must be wash'd and dipt in Wine boil'd with Allum and Salt, whereof a Cataplasm may be afterward made, by adding Meal of Rye, Honey, and Brimstone. The Juice of a hot Turnep apply'd with *Unguentum Rosatum*, is also very good, or *Petroleum* alone.

What is a Panaritium?

Panaritium or *Paronychia*, is a Tumour which generally ariseth in the Extremity of the Fingers, at the Root of the Nails: It is red, and accompanied with very great Pain, even so exquisite, that the whole Arm is sensible thereof, insomuch that a Fever sometimes ensues, and a Gangrene; the Humour being contain'd between the Bone and the *Periosteum*, or that little Membrane with which it is immediately invested.

What Remedies are convenient for the curing a Panaritium?

Anodyn Cataplasms are to be first apply'd; that is to say, such as serve to assuage excessive Pain, as that which is composed of Milk, Line-seeds beaten, large Figs, the Yolk of an Egg, Saffron, Honey, and *Oleum Lumbricorum*, with the Crumb of White-Bread. Afterward you may endeavour to dissolve it, by applying Oil of Almonds, *Saccharum Saturni*, and Ear-Wax, or else Balsam of Sulphur. The *Emplastrum de Mucilaginis*

and *Diaſulphuris* diſſolv'd in Wine, is alſo a moſt excellent Reſolvent and Anodyn.

If it be requiſite to bring this Tumour to Suppuration, the Roots of white Lilies roasted under Embers may be added to the preceding Cataplaſm; or elſe a new Cataplaſm may be made with Sorrel boil'd, freſh Butter and a little Leaven.

What is a Burn?

A Burn is an Impreſſion of Fire made upon a Part, wherein remains a great deal of Heat, with Bliſters full of *Seroſities*, or perhaps an *Eſcarr*, accordingly as the Fire hath taken more or leſs Effect.

What are the Remedies proper for a Burn?

A Burn is cur'd by the ſpeedy Application of freſh Clay or Earth re-iterated many times ſucceſſively; by that of Onions pounded in a Mortar, *Unguentum Roſatum*, and *Populeon*, mixt with the Yolk of an Egg and unſlak'd Lime; Cray-Fiſhes or Crabs pounded alive in a Leaden Mortar; and a great Number of other things.

If the Burn be in the Face, you may more eſpecially take the Mucilages of the Seeds of Quinces and *Pſyllium*, and Frog's Sperm, of each an equal Quantity, adding to every Four Ounces Twenty Grains of *Saccharum Saturni*. This Compoſition may be ſpread on the Part with a Feather, and cover'd with fine brown Paper. It is an admirable and approved Receipt.

If the Burn had made an *Eſcarr* or Cruſt, it may be remov'd with freſh Butter ſpread upon a Colewort or Cabbage-Leaf, and apply'd hot. But in caſe the Cruſt be too hard, and doth not fall off

off, it must be open'd, to give Passage to the Pus or corrupt Matter, the Stay of which would occasion a deep Ulcer underneath. The same Method is to be observ'd in the Pustules or Blisters, Two Days after they are rais'd, applying also the Ointment of Quick-Lime, Oil of Roses, and Yolks of Eggs.

ARTICLE II.

Of the Erysipelas and its Dependances.

WHAT is an Erysipelas?

An *Erysipelas*, commonly call'd *St. Anthony's Fire*, is a small Elevation produc'd by a Flux of Choler dispers'd and running between the Skin and the Flesh. It is known by its yellowish Colour, great Heat and Prickings.

R E M E D I E S.

What are the Remedies proper for an Erysipelas?

An *Erysipelas* that ariseth in the Head and Breast is not without Danger, and the Cure of it ought to be undertaken with great Care in the Application as well of Internal as External Remedies: For it is requisite to take inwardly a Dose of Diaphoretick *Antimony*, Crabs-Eyes, Egg-shells, Powder of Vipers, and other Medicines; as also Potions that have the like Virtues, such as the following: Take Four Ounces of Elder-Flower-Water, adding thereto a Scruple of the Volatile Salt of Vipers or Harr's-Horn, with an Ounce of Syrrup of red Poppies.

Phle.

Phlebotomy or Blood-letting hath no place here, unless there be a great Plethory, but frequent Clysters are not to be rejected, viz. such as are made of Whey, Chervil, Succory and Violet-Plants, adding a Dram of Mineral Crystal dissolv'd with two Ounces of Honey of Violets.

As for outward Applications, Linnen Rags dipp'd in the Spirit of Wine impregnated with Camphire and Saffron, are to be laid upon the Tumour, and renew'd as fast as they are dry'd. An equal Quantity of Chalk and Myrrh beaten to Powder, may also be strew'd upon a Sheet of Cap-Paper spread with Honey, and apply'd to the Part.

If the Heat and Pain grow excessive, take half a Dram of *Saccharum Saturni*, Twenty Grains of Camphire, as much Opium, with two Drams of red Myrrh: Infuse these in a Gallon of White-wine: Let this Liquor be kept to soak the Cloaths that are laid upon the *Erysipelas*, which must be often renew'd. But to dress the Face, a Canvas Cloth may be us'd, which hath been dipp'd in a Medicine prepar'd with a Gallon of Whey, Two Yolks of Eggs, and a Dram of Saffron.

Moreover amidst all these Remedies, it is necessary to oblige the Patient to keep to a good Diet, and to prescribe for his Ordinary Drink a Diet-Drink made of Hart's-Horn, the Tops of the lesser Centory, Pippins cut in Slices with their Skins and Liquorish; a little good Wine may be also allowed, with the Advice of the Physician.

Of Erysipelatous Tumours or Impostumes, and their Remedies.

What are the Tumours or Impostumes that partake of the Nature of an Erysipelas?

They are the dry and moist. *Herpes*, the former being that which is call'd the *Tetter* or *Ring-worm*, and the other a kind of yellow *Bladders*, *Pustules* or *Wheals*, that cause *Itching*, and raise much *corroding Ulcers* in the *Skin*: To these may be added divers sorts of *Scabs* and *Itch*.

The Remedies prescrib'd for the *Erysipelas* may be us'd for both these kinds of *Herpes*; as also *Lotions* or *bathing Liquors* made of *Lime-Water* and a *Decoction* of *Wormwood* and *Sal Armoniack*, allowing half a *Dram* to *Four Ounces* of *Liquor*. Or else take half a *Dram* of *Sal Saturni*, and put into a *Glais* of the *Decoction* of *Fumitory* or *Chervil*. You may also make use of the *Oil* of *Tartar per deliquium*, to make a *Liniment* either alone, or mingl'd with the above-mention'd *Decoctions*.

ARTICLE III.

Of the Oedema.

WHAT is the Oedema?

It is a white soft Tumour, with very little sense of Pain, which ariseth from the *Setling* of a *pituitous Humour*.

What are the Remedies proper for an Oedema?

They are *Fomentations*, *Cataplasms*, *Liniments* and *Plaisters*. The

The Fomentations are made with bundles of Wall-wort, or Dwarf-Elder, thrown into a hot Oven after the Bread is bak'd, and sprinkl'd with Wine. Afterward being taken out smoaking, they are unty'd open'd and wrapp'd about the Part, putting a warm Linnen Cloth over 'em. This Operation is to be re-iterated; and by this means the Humour is dissolv'd through Transpiration by Sweat.

The Cataplasms are compos'd of Camomile, Melilot, St. John's-wort, Sage, Wall-wort, Pellitory of the Wall, Roots of Briony and Onions, all boil'd together in White Wine with Honey, adding, if you please, a few Cummin or Fennel-Seeds beaten. Cataplasms are also made of Horse-dung and the Seeds of Cummin beaten, which are boil'd in strong Vinegar, and mix'd with Barley-Meal to the Consistence of Pap.

The Plaisters are prepar'd with an Ounce of *Diapalma*, half an Ounce of *Martiatum*, a Pint of Oil of Lilies, half an Ounce of Cummin-Seeds powder'd, half a Dram of *Sal Ammoniack*, and an Ounce of yellow Wax to make a Consistence.

If any Hardness remains, the Plaister of Mucilages may be apply'd; or that which is made of the Gums, *Bdellium*, *Ammoniack*, and *Galbanum*, dissolv'd in Vinegar. But Care must be taken not to omit the Purgatives of Jalap to the quantity of a Dram, in a Glas of White-wine; or of half an Ounce of Lozenges of *Diacarthammum*, which are effectual in exhausting the Stock of Serofities, which nourish Oedematous Swellings.

Of Oedematous Tumours and Impostumes.

What are the kinds of Tumours that partake of the Nature of an Oedema ?

They are the *Phlyctena* and *Emphysema*, the *Batrachos* or *Ranunculus*, the *Wen*, the *Talpa*, the *Bronchocele*, the *Ganglion*, the *Fungus*, the *Scurf*, the *Scrophula* or *King's-Evil*, and all sorts of Dropsies both general and particular.

What are Phlyctæna's ?

They are Pustules or Blisters fill'd with a white and somewhat yellowish Humour.

What is an Emphysema ?

It is a kind of flatuous Tumour, wherein Wind is contain'd, with a little slimy Phlegm.

What is a Batrachos or Ranunculus ?

It is a Blister fill'd with slimy Water that ariseth under the Tongue near the String, and in French is call'd *Grenouillette*, or the little Frog ; which is the same with its Greek and Latin Names.

What is a Wen ?

It is a Tumour consisting of thick, tough, pituitous Matter, like Plaister, and is reckon'd among the *Encysted Swellings*.

What is a Talpa ?

It is a soft and pretty large Tumour, which usually appears in the Head and Face, containing a white, thick and pituitous Matter.

What is a Bronchocele ?

It is a Tumour which ariseth in the Throat, and distends it exceedingly ; being compos'd of thick Phlegm mixt with a little Blood, and is rank'd among the *Encysted Tumours*.

What

What is a Ganglion?

It is a very hard Tumour, void of Pain, and moveable, produc'd by thick Phlegm: This is always found upon some Nerve or Tendon.

What is a Fungus?

It is a spongy Tumour that grows upon Tendons bruised or weaken'd by some Hurt.

What is the Scurf?

It is a whitish and scaly Tumour rais'd in the Skin of the Head by a viscous and mix'd Phlegm, having its Root in the bottom of the Skin.

What is the Scrophula or King's-Evil?

Scrophula or *Strumæ*, commonly call'd the *King's-Evil*, are Tumours that generally shew themselves in the Glandules of the Neck, and in all those Parts where there are any. They consist of a viscous, ferous, and malignant Phlegm, the Source or Root whereof is suppos'd to be in the Glandules of the *Mesentery*. They are also of the Number of the *Encysted Tumours*.

What is the Dropsie?

It is a soft Tumour occasion'd by the settling of abundance of ferous Matter in the Parts where it appears.

How many sorts of Dropsies are there?

There are three general Species, viz. the *Ascites*, *Tympanites*, and *Leucophlegmatia*.

What is an Ascites?

It is a kind of Dropsie that forms the Tumour or Swelling of the *Abdomen* or lower Belly, by a Mass of Water.

What is a Tympanites?

It

It is a kind of Dropsie, which in like manner cauſeth a Tumour or Swelling in the lower Belly, with this difference, that a great deal of Wind is mix'd with the Water, which renders the Tumour transparent, and ſounding as it were a Drum, whence this Diſeaſe hath taken its Name.

What is the Dropsie, call'd Leucophlegmatia ?

It is a Tumour ; or, to ſpeak more properly, a general Swelling or Bloating of all the other Parts of the Body, as well as of the lower Belly. It is produc'd by a viſcous and muſcilaginous ſort of Phlegm ; whence it happens, that the Print of the Fingers remains in thoſe Places that have been preſt.

What are the particular kinds of Dropsies ?

They are thoſe that are incident to different Parts of which they bear the Names ; as the *Hydrocephalus*, which is the Dropsie of the Head : the *Exomphalus*, of the Navel, and the *Hydrocele* of the *Scrotum*. There is alſo a Dropsie of the Breſt, and of the Womb.

What are the Remedies proper for all theſe ſorts of Tumours or Dropsies ?

They are in general all thoſe that are agreeable to the *Oedema*, which are variously uſed ; as, Liniments, Fomentations, Cataplaſms and Plaſters : Internal Medicines ought alſo to be much conſider'd, as Diaphoreticks, Sudorificks, and Purgatives, when they are aſſiſted by a regular Diet.

A Decoction of the Roots of Briony with Cinnamon and Liquoriſh, provokes Urine very much, as well as a Decoction of Turnips and Carrets, and an Infuſion of Sage in White-wine.

ARTICLE IV.

*Of a Scirrhus, and its peculiar Remedies.**WHAT is a Scirrhus?*

It is a hard unmoveable Tumour, almost altogether void of Pain, and of a livid dark Colour; which is form'd of a Melancholick Humour, frequently succeeding *Phlegmons* and *Oedema's* that have not been well dress'd with convenient Remedies.

How is a Scirrhus cured?

By mollifying or dissolving it, and seldom by bringing it to Suppuration.

It may be mollify'd by the Application of a Cataplasim or Pultis, compos'd of the Leaves of Violet-Plants, Mallows, Beets, Elder, Rue, and Wormwood, with Camomile-Flowers, Horse-Dung, Cow-Dung and White-Lillies. The whole Mass is to be boil'd together in Wine, afterward adding Honey and Hogs-Lard, to make a Cataplasim thereof with the Crum of white Bread.

It is dissolv'd with Plaisters compos'd of those of *Diachylon*, *Melilot*, and *Mucilages*, to which is added *Oleum Lumbricorum*, and Flower of Brimstone. To render the Remedy more effectual, Oil of Tobacco may be also mix'd with it, and Gum *Ammoniack* dissolv'd in Vinegar.

Furthermore, these Topical or outward Medicines are to be accompany'd with others taken

ken inwardly, which serve to prepare the Humours for convenient Evacuations ; Such are Crab's-Eyes, the Decoctions of *Sarsaparilla*, the Use of good Wine, and light Meats of easie Digestion.

Of Scirrhus Tumours, and their Remedies.

What are the Tumours that partake of the Nature of a Scirrhus ?

They are the *Polypus*, *Carcinoma*, *Sarcoma*, *Natta* or *Ficus*, and *Cancer*.

What is a Polypus ?

It is an Excrecence of fungous Flesh arising in the Nostrils : But *Hippocrates* confounds the *Carcinoma* and *Sarcoma* with the *Polypus*, of which he says they are only a *Species*.

What is the Natta or Ficus ?

It is a Tumour or Excrecence of Flesh that appears in the Buttocks, Shoulders, Thighs, Face, and every where else, the various Figures of which cause it to be call'd by different Names. For one while it resembleth a Gooseberry, at another time a Mulberry, and at another time a Melon or Cherry. Sometimes also these Swellings are like Trees, Fishes, Birds, or other sorts of Animals, according to the ardent Desire that Women with Child have had for things that they cou'd not obtain when they long'd for 'em.

What are the Remedies proper for the Polypus, and other kinds of Excrecences of the like Nature ?

The *Polypus* may be cur'd in the beginning, but it is to be fear'd, lest it degenerate into an in-

cu-

curable Cancer, when it hath been neglected or ill drest.

Besides the general Remedies, which are letting blood a little, and re-iterated Purgations, with an exact Regulation of Diet, there are also particular Medicaments which dry up and insensibly consume the Excrecence; as a Decoction of *Bistort*, *Plantain*, and *Pomegranate-Rhinds* in *Claret-Wine*, which is to be snuff'd up the Nose many times in a Day, and serves to soak the small Tents that are put therein, as also often to cool the Part, adding a little *Alum* and *Honey*.

The Patient must sometimes likewise keep in his Mouth a *Sage-Leaf*, sometimes a Piece of the Root of *Pellitory of Spain*; and at another time *Tobacco* or some other thing of this nature, which brings the *Saliva* into the Mouth. If the Tumour continues too long, and doth not yield to the above-mention'd Remedies, it is necessary to proceed to a Manual Operation, which is very often perform'd with good Success.

As for the *Natta's* it is most expedient not to meddle with them at all; nevertheless these Marks which Infants bring along with them into the World, are frequently taken off by an Application of the After-Burdens, whilst they are as yet warm, as soon as their Mothers are deliver'd.

What is a Cancer?

It is a hard, painful, and ulcerous Tumour, produc'd by an adust Humour, the Malignity whereof can scarce be suppress'd by any Remedies.

How

How many sorts of Cancers are there ?

There are two kinds, *viz.* the Primitive and the Degenerate: The Primitive Cancer is that which comes of it self, and appears at first about the bigness of a Pea or Bean, which nevertheless doth not cease to cause an inward Pain, continual, and pricking by Intervals; during this time it is call'd an *Occult Cancer*; but when grown bigger, and open'd, it bears the Name of an *Ulcerated Cancer*; which is so much the less capable of being cur'd or aswag'd, as it makes it self more conspicuous by its dreadful Symptoms, or concomitant Circumstances.

The Degenerate Cancer is that which succeeds an obstinate and ill-dress'd Tumour or Impostume, and which becomes an Ulcerated Cancer, with out ever having been an Occult or Latent one at first.

What Remedies are requisite to be apply'd to a Latent Cancer ?

In regard that it cannot be known in this Condition without Difficulty, it is often neglected; nevertheless it is a Matter of great moment to prevent its Consequences, more especially by a good Diet and by general Remedies, which may gently rectifie the Intemperature of the Bowels: Afterwards the Baths may be prescrib'd, together with the Use of Whey, Asses-Milk, and Specificks in general, as Powders of Crabs-Eyes, Vipers, Adders and others. As for Topical Remedies, none are to be administred, except it be judg'd convenient to apply to the Tumour a Piece of Lead rubb'd with Quicksilver; all others serving only to make the Skin tender, and

apt

apt to break: The Patient may also take for his Drink, Water of *Scorzonera* and Harts-horn, with the Flowers of *Buglos* or *Borage*, and Liquorice: Or else Quicksilver Water alone, boiling an Ounce of it in a Quart of Water every time, the Quicksilver always remaining at the bottom of the Vessel.

What are the Remedies for an Ulcerated Cancer?

Besides the general ones, that are the same with those of the blind Cancer, there are also Topical, which may take place here. The Powders of Toads, Moles, Frogs, and Crabs calcin'd, cleanse the Ulcers perfectly well. A Decoction of Vipers and Crabs, may serve to bathe 'em, and some of it may be taken inwardly. Deterfives made of Lime-Water, or Whey clarify'd and boil'd with *Chervil* are very good; and (if you please) you may add Camphire or *Saccharum Saturni*.

If the Pains grow violent, recourse is to be had to *Laudanum*, one or two Grains whereof may be given in a little Conserve of Roses. When the Cancer is situated in the *Glandules*, or Flesh, the Extirpation of it may also be undertaken with good success.

As for the manner of treating degenerate Cancers, respect must be always had to the kind of Tumour from whence it deriv'd its Original.

C H A P.

C H A P. IV.

Of Bastard or Encysted Tumours.

WHAT is an Encysted or Bastard Tumour or Impostume?

It is that which is made of a settling of mixt and corrupt Humours, the Matter whereof is contain'd in certain proper *Cystes* or Membranous Bags.

What are the kinds of these Tumours?

They are the *Steatoma*, the *Atheroma*, the *Meliceris*, the Wen, the *Broncocele*, and the *Scrophula* or King's-Evil.

How is the Difference between these Tumours discern'd?

The *Steatoma* is known by its Matter resembling Suet; as that of the *Atheroma* resembleth Pap; and that of the *Meliceris* is like Honey: These three Tumours cannot be well distinguish'd on the Outside, in regard that they do not change the natural Colour of the Skin, which equally retains in all three the Print of the Fingers that press it. But the *Broncocele* is discover'd by the Place and Part which it possesseth; that is to say, the Throat; as also by its somewhat hard Consistence without the Alteration of the Skin. The *Scrophulae*, or King's-Evil Swellings are known by their unequal Hardness, and their Situation in the Glandules, either in the Neck, Arm-pits or elsewhere, without Alteration likewise of the Skin.

R E M E D I E S.

What is the Method to be observ'd in curing these sorts of Tumours ?

An Attempt is to be made to dissolve 'em, as in all the others; nevertheless the safest way is to bring 'em to Suppuration, and to extirpate the Cyst's, which are apt to be fill'd again after the Diffipation of the Humour.

What are the Medicines proper to dissolve these Tumours ?

They are all such as may be us'd for the Oedema and Scirrhus; but the Specificks or particular Remedies are these :

Take Rosemary, Sage, Wormwood, Elder, great Celandine, Camomile, Melilot, St. John's-wort, and Tobacco; boil 'em in White-wine with Soot and *Mel Mercuriale*, adding thereto Cummin-Seeds beaten, and *Oleum Lumbricorum*, to make a Cataplasm, which is to be renew'd twice a Day. Afterward, if the Tumour be not dispers'd, you may apply the following Plaister, which hath an admirable Effect.

Take an equal Portion of the *Emplastrum Diabylon* and *Devigo*, and four times as much Mercury, and *Emplastrum Divinum*; let them be dissolv'd together; then mix Saffron and Oil of Tobacco enough to make a Plaister with the whole Mass, which may be spread upon thin Leather, and apply'd to the Tumour, taking it off only once every eighth Day, to cool it; let it be laid on again after having wash'd and bath'd the Part with warm Urine or Brine.

But

But it is to be always remember'd that external Remedies take effect only imperfectly, unless they are assisted by Internal, such as in this case are reiterated Purgations, join'd with a regular Diet.

What are the Remedies proper to excite Suppuration?

To this purpose those may be us'd that serve in other kinds of Tumours: but as for the Extirpation, of the *Cyst's*, it is done by dividing the Tumour into four Parts, by procuring Suppuration, and by consuming the Bag by little and little. The *Bronchocele* alone will not admit this Extirpation by reason of the great Number of Nerves, Veins and neighbouring Arteries amidst which the Tumour is settl'd.

CH A P. V.

Of Critical, Malignant, Pestilential, and Venereal Tumours and Impostumes.

WHAT difference is there between Critical, Malignant, Pestilential, and Venereal Tumours?

It consists in these particular Circumstances, viz. that Critical Tumours or Impostumes are indifferently all such as are form'd at the End or Termination of Diseases, in whatsoever Place or Part they appear.

Malignant Impostumes or Tumours are those that are obstinate, and do not easily yield to the most efficacious Remedies.

Pestilential Impostumes or Tumours are those that are accompanied with a Fever, Swooning, Head-ach and Faintness: They usually arise in the time of a Plague or Pestilence, and are contagious.

Venereal Tumours or Impostumes are those that appear at the bottom of the Groin, and are the Product of an impure *Coitus*.

For this Reason the Critical Impostume may be Malignant, Pestilential or Venereal; the Malignant Impostume may be neither Critical, nor Pestilential nor Venereal. But the Pestilential and Venereal Tumours are always Malignant.

What are the ordinary kinds of Critical Tumours or Impostumes?

They are the *Anthrax*, the Boil, the *Phlegmon* and the *Parotides* or Swellings in the Almonds of the Ears.

What are the kinds of malignant Tumours or Impostumes?

They are the *Cancer*, the *Scrophula* or King's Evil; and others of the like nature.

What are the kinds of Pestilential Tumors or Impostumes?

They are Carbuncles that break out every where; a sort of *Anthrax* which appears under the Arm-pits, and *Bubo's* in the Groin.

What are the kinds of Venereal Tumours or Impostumes?

They

They are Botches, or *Bubos* and *Cancers* that arise in the Yard; as also *Wens* and *Condylomata's* in the Fundament.

What is the difference between a Pestilential and a Venereal Bubo?

They may be distinguish'd by their Situation, and respective Accidents; the Pestilential lying higher, and the Venereal lower: Besides, a Fever, Sickness at the Heart, and an Universal Faintness or Weakness, are the ordinary concomitant Circumstances of the former; whereas the Venereal *Bubo* is always the Consequence of an impure *Coitus*, and is attended with no other Symptoms than those of common Tumours, *viz.* Pain, Heat, Shootings, or Prickings, &c.

As for the Remedies, they may be sought for among those that have been already prescrib'd for Tumours.

CHAP. VI.

Of the Scurvy.

THIS Disease is known by the Ulcers of the Mouth which are very stinking; as also by excessive Salivation, great Pains in the Head, Dizziness, *Epilepsies*, *Apoplexies*, and Palsies. The Face being of a pale red and dark Colour, is sometimes puff'd up or bloated, inflam'd and beset with Pustules: The Teeth are loose and ake, the Gums are swell'd, itch, purrle, exulcerate and are eaten with the Canker; and the Jaw is almost unmovable: The

Members are bow'd, and cannot be extended: The Patients become stupid and drowsie, so that they fetch their Breath with difficulty, are obnoxious to Palpitations of the Heart and Coughs, and fall into Swoons: The Ulcers sometimes are so malignant, that their Cheeks are intirely eaten up, and their Teeth seen: They are also much inclin'd to Vomiting, Looseness and Gripes; and their Bowels are swell'd: They have red and livid Pustules on their Belly and Privy-parts, which sometimes break out into Ulcers; their whole Body being dry'd, &c.

This Disease may be easily cur'd in the beginning; but when it is grown inveterate, and invades the necessary Organs of Life, it becomes incurable; as well as when it is the Epidemical Disease of the Countrey, or the Persons afflicted with it, are old, or well advanc'd in Years.

In undertaking the Cure, it is requisite to begin with a good Diet, and to sweeten the Blood; let the Patient take the Broth of boil'd Fowl, eating Pullers and Eggs; in the Broth may also be put divers sorts of Antiscorbutick Herbs, viz. Cresses, Spinage, Parsley-Roots, Sparagus, Smallage, Scorzonera, Scurvy-grass, &c. Let him eat nothing that is high season'd, nor acid or sharp; let him drink pure Claret, without any adulterate Mixture; let him use moderate Exercise and Rest: Lastly, let him keep his Mind sedate, and free from all manner of violent Passion.

The following Remedies taken inwardly, are very good for the Scurvy, viz. the Tincture of Flints from Ten Grains to Thirty; Disphoretick

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Antimony, from Six Grains to Thirty; sweet Sublimate, from Six Grains to Thirty; *Mars Diaphoreticus*, from Ten Grains to Twenty; *Crocus Martis Aperitivus*, from Ten Grains to Two Scruples; prepar'd Coral, from Ten Grains to One Dram; Volatile Spirit of *Sal Ammoniack*, from Six Drops to Twenty; Water of Cresses, from Fifteen Drops to one Dram; Spirit of Scurvy-grass, from Ten Drops to One Dram: Tincture of Antimony, from Four Drops to Twenty; Oily Volatile *Sal Ammoniack*, from Four Grains to Fifteen; Spirit of *Guajacum*, from half a Dram to a Dram and a half; *Vitriolate Tartar*, from Ten Grains to Thirty; the Volatile Salt of *Tartar*, Urine, Vipers, and Hart's-horn, of each from Six Grains, to Fifteen; the Spirit of Gum *Ammoniack*, from Eight Drops to Sixteen; white Mercury precipitate, from Four to Ten Grains; *Mercurial Panacea*, from Six Grains to Two Scruples. We shall shew the manner of compounding 'em in our Treatise of *Venercal Diseases*.

It is also expedient to give Emollient and Deterfive Clysters to the Patient at Night going to Bed, his Body being always kept open with convenient Diet-drinks: afterward let him take gentle Sudorificks, such as are made of the Decoctions of Fumitory, wild Cicory, Dandelion, Harts-Tongue, Scabious, the lesser House-Leek, Germanander, Borage, *Scorzonera*-Root, and Polypody, with Flowers of Broom, Elder, and Marigold.

These are stronger for cold Constitutions, viz. Decoctions of Scurvy-grass, *Lepidium*, Arsmarr, the Lesser Celandine, Wormwood, Little House-Leek, *Trifolium fibrinum*, *Angelica*, Juniper-Berries, &c.

Convenient Decoctions to wash the Mouth may be made with Sage, Rosemary, Hyssop, Oak-Leaves, Scurvy-grass, Cresses, Tobacco, Roots of Bistort, Birth-wort, Tormentil, Flower-de-Luce, *Balaustia* or Pomegrate-Flowers, Red Roses, &c.

To corroborate the Gums, Gargarisms are made of Antiscorbutick Plants; as of Spirit of Scurvy-Grass two Drams, one Scruple of Spirit of Vitriol, one Scruple of common Salt, four Ounces of Rose-Water and Plantane-Water. But if the Gums are putrified, they are to be rubb'd with Honey of Roses, and some Drops of Spirit of Salt.

To assuage the Pains of the Members, Bathings and Fomentations are to be us'd; and a Decoction of Saxifrage taken inwardly, with some Grains of *Laudanum* is good for that purpose.

To allay the Gripes, Clysters may be given with Whey, Sugar, Yolks of Eggs, Syrop of Poppies, and Oils of Earth-Worms, Scurvy-Grass, Camomile, &c.

Against the Scorbutick Dropsie, take the Essence of *Trifolium Fibrinum* and Elicampagne, from twenty four Drops to thirty, and continue the Use thereof.

Milk taken inwardly hinders Vomiting; and a Broth or Gelly of Crabs sweetens the Blood. The Looseness may be stop't with the Essence of Wormwood, and Spirit of *Mastick*; as also the Fever, with Febrifuges and Antiscorbuticks.

The Spots may be fomented with Decoctions of Aromatick and Anti-Scorbutick Herbs and Nitre. For the Ulcers of the Legs, pulverize an equal quantity of *Saccharum Saturni*, *Crocus Martis*, Myrrh, and *Mercurius Dulcis*, and anm the Pledgits with these that are to be apply'd to the Sores.

To mollifie the sharpnels of Acid Humours, this is a good Remedy: Take half an Ounce of Spirit of Scurvy-grass, two Drams of tartariz'd Spirit *Ammoniack*, a Dram of the Tincture of Worms. Give thrice a Day fifteen or twenty Drops of this Liquor, in a Decoction of Firr Tops.

Against the Tubercles, Take two Handfuls of the Flowers of Camomile and Elder, three Drams of Briony-Root, and an Handful of White-bread Crumb; boil the whole Composition in Milk, and make Cataplasms thereof.

To mitigate the Pains in the Head, take twenty or thirty five Drops of the Tincture of Amber, in Antiscorbutick Spirits or Waters.

The difficulty of Respiration may be remov'd by a Medicinal Composition made of two Drams of an Antiscorbutick Water, two Drams of the Essence of Elicampane, and half a Dram of the Spirit of Gum *Ammoniack*; take three or four Spoonfuls thereof several times in a Day.

To prevent the putrefaction of the Gums, take one Dram of the Tincture of Gum *Lacca*, three Drams of the Spirit of Scurvy-grass, with fifteen or twenty Drops of Oil of Tartar made *per Deliquium*, and rub the Gums with this Composition many times in a Day. Brandy in which Camphire is infus'd, or Spirit of Wine, is likewise a most excellent Remedy; as also all Lotions

or Washes made with the Waters or Decoctions of Antiscorbutick Plants.

For Leanness, Goats'-Milk with the Spirit of Scurvy-grass may be us'd, and other Waters drawn from Antiscorbutick Plants. The Apozemes or Decoctions of Endive, Cicory, Sorrel, *Becabunga*, and Snail Water, are in like manner very good for the same purpose.

Ointment of *Styrax* is frequently us'd in the *Horel-Dieu* at *Paris*, for Spots and Hardnesses that arise in the Legs.

A

TREATISE

OF

Wounds, Ulcers and Sutures.

CHAP. I.

Of Sutures.

SUTURES or Stitches are made only in recent, and as yet bleeding Wounds, when they cannot be reunited by Bandage, as are the transverse; provided there be no Contusion, nor loss of Substance, nor great Hemorrhages, as also that the Wounds were not mad by the biting of venomous Beasts, that there be no violent Inflammations, and that the Bones are not laid open; because then generally 'tis necessary to cause 'em to be exfoliated; neither is this Operation to be perform'd in the Breast, by reason of its Motion.

The Instruments proper for the making of Stitches, are streight and crooked Needles, I; with

with waxed Thread ; and these Sutures are of four sorts, viz first, the *Intermittent Stitch* for transverse Wounds ; the second for the Hare-Lip ; the third, commonly call'd the *Dry Stitch*, for superficial Wounds ; and the fourth, term'd the *Glover's Stitch*.

The *Intermittent Stitch* is that which is made at certain separated Points, according to the following manner : After having taken away all extraneous Bodies out of the Wound, let a Servant draw together its Sides or Lips ; and let a Needle with waxed Thread be pass'd thro' the middle from the outside to the inside, several Points being made proportionable to its length. It is requisite to pierce a good way beyond the Edge of the Wound, and to penetrate to the bottom, lest any Blood should remain in the Space, that might hinder the re-uniting.

If the Wound hath Corners, the Surgeon begins to sow there ; and before the Knot is made, causeth the Lips of the Wound to be drawn exactly close one to another : The Knots must be begun with that in the middle, and a single one is first made on the side opposite to the running of the Matter ; laying upon this Knot (if it be thought convenient) a small Compress of Rags waxed, on which is tied a Slip-Knot, to the end that it may be untied if any bad Accident should happen. If a Plaister be apply'd to the Wound after the Stitching, a small Compress is to be laid over the Knots, to prevent their sticking to the Plaister. In case any Inflammation happens in the Wound, the Knots may be loosen'd and ty'd again when the Symptoms cease : But
if

if the Inflammation continue, the Threads are to be cut by passing a Probe underneath: When the Wound is clos'd, the Threads are cut in like manner with a Probe; and in drawing 'em out, a Finger must be laid near the Knot, lest the Wound should open again.

To make the second sort of Stitch for the Hare-Lip, a small streight Needle is pass'd into the sides of the Wound, and the Thread is twisted round the Needle, by crossing it above at every Stitch.

To form the *Dry Stitch* in very superficial Wounds, a piece of new Linnen Cloth is to be taken, wherein are made Digitations, or many Corners; the Selvedge or Hem ought to be on the side of these Corners or Digitations; and a small Thread Lace is ty'd to every one of 'em. Afterward this Cloth is dipt in strong Glue, and apply'd about a Finger's breadth from the Edges of the Wound; so that a piece thereof being stuck on each side, the Laces may be ty'd together, to cause the Lips of the Wound to meet.

To make the *Glover's Stitch*, the Operator having drawn together the Lips of the Wound, holds 'em between two Fingers, passeth a Needle underneath 'em, and sowerth 'em upward all along, after the manner of *Glovers*.

C H A P. II.

Of Wounds in general.

W*hat is a Wound ?*

A Wound is a recent, violent, and bloody Rupture or Solution of the natural Union of the soft Parts, made by a pricking, cutting, or bruising Instrument,

What ought to be observ'd before all things in the curing of Wounds ?

It is requisite to take notice of their differences, as well as of the Instruments with which they were made ; to the end that Consequences may be drawn from thence for the Application of proper Remedies.

From whence ariseth the difference of Wounds, and which be they ?

They are taken either from their Figure or Situation. With regard to their Figure, they are call'd Long, Broad or Wide, Triangular Great, Little, Superficial, or Deep ; and with respect to their Situation, they are term'd Simple, Complicated, Dangerous, or Mortal.

What is a Simple and a Complicated Wound ?

A Simple Wound is that which only opens the Flesh, and hath no other concomitant Circumstances ; but a Complicated Wound, on the contrary, is that which is attended with grievous Symptoms, as Hæmorrhages, Fractures of Bones, Dislocation, Lameness, and others of the like Nature.

What

What is a dangerous and mortal Wound ?

A dangerous Wound is that which is complicated, the Accidents whereof are dreadful : As when an Artery is open'd or prick'd, when a Nerve or Tendon is cut, or when the Wound is near a Joynt and accompanied with a Dislocation or Fracture. A mortal Wound is that which must be inevitably follow'd by Death ; as is that which is situated deep in a principal part necessary for the Preservation of Life.

What are the Parts wherein Wounds are mortal ?

They are the Brain, the Heart, the Lungs, the Oesophagus or Gullet, the Diaphragm, the Liver, the Stomach, the Spleen, the small Guts, the Bladder; the Womb, and generally all the great Vessels.

Wherein doth the Cure of Wounds consist ?

In helping Nature readily to procure the reuniting of the Parts that have been divided, after having taken away or asswag'd every thing that might prove an Obstacle.

What are the things that hinder the speedy reunion of the Parts ?

They are extraneous Bodies found therein, as Bullets, Flocks, and Pieces of Wood or Stone, &c. As also sometimes the Accidents which attend 'em ; as an *Hæmorrhage* or Flux of Blood, Inflammation, *Esthiomenus* or Mortification, *Hyperfarcosis*, or an Excrecence of Flesh, Dislocation, the Fracture of a Bone, the Splinter of a Bone, and sometimes a noxious Air.

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R E M E D I E S.

What are the Remedies proper for stopping an Hemorrhage or Flux of Blood?

The common Remedy is a kind of Cataplasim; made up with the Powders of Aloes, Dragon's blood, Bole Armony, and Whites of Eggs, which are mix'd together and laid upon the Wound: but the following is an excellent one.

Take two Ounces of Vinegar, a Dram of Colcothar, two Drams of *Crocus Martis* Astringent; beat the whole together, steeping *Muscus Quercinus* therein; then throw upon it the Powder of Mushrooms, or of *Crepitus Lupi*: apply this Remedy, and you'll soon stop the Hemorrhage, taking care nevertheless to bind the Part well, otherwise the Astringents do not readily take effect.

To this purpose you may also make use of Cobwebs, Mill-Dust, and the Powder of Worm-eaten Oak; or else take Oven Soot mixt with the Juice of the Dung of an Ass or Ox, adding only thereto the White of an Egg.

Besides these Remedies there are also actual and potential Cauteries, or simple Ligatures, which are infallible. Indeed the actual Cautery is not always sure; because when the Escar made by the Fire falls off, the Hemorrhage breaks out again as before: but the potential Cautery is almost always successful; such as the following.

Take about an equal Quantity of Vitriol and Powder of Mushrooms; apply 'em upon a little Lint to the Place where the Blood issueth forth

forth, and this will stop it immediately: But care must be taken to avoid touching a Nerve or Tendon; by reason that the Vitriol is apt to excite Convulsion.

How is the Inflammation and Mortification of a Wound suppress'd?

If the Inflammation proceeds from the Presence of an Extraneous Body, it must be taken away as soon as possible with a pair of Forceps, and if from the quantity of Pus or corrupt Matter, it must be let out. But in case the Inflammation arises from extreme Pains, they are to be assuaged with Cataplasms or Pultises and anodyn Liniments, such as those already prescribed in the Cure of the *Phlegmon*: or else the Part may be bath'd with Camphorated Spirit of Wine, mixt with as much Water. *Saccharum Saturni* infus'd in Lime-water, performs the same Effect, and the Water of Crabs alone is admirable in its Operation.

Against the *Esthomenus* or Mortification, make use of Wine boild with Wormwood, St. John's Wort, Rosemary and Aloes; or else take the Tincture of Aloes and Myrrh, or Spirit of Wine alone impregnated with Camphire and Saffron.

What is to be done in Case a Convulsion happens by reason of a wounded Nerve or Tendon?

If the Convulsion be caus'd by the Presence of an Extraneous Body that bruileth the Part it must be taken away; and if from the wounding of a Nerve, pour into the Wound some Drops of the Oil of Lavender distill'd, which in that Case is of singular use: This Oil may be also taken inwardly in an appropriated Liquor, such as a
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Decoction of Wormwood and the tops of the lesser Centory Balsam of *Peru* us'd in the same manner, is an excellent Remedy, and the Oils of Worms, Snails, St. *John's* Wort and Turpentine are frequently apply'd with good Success.

If the Convulsion proceeds from the biting of some venomous Creature, Cupping-Glasses or Leeches are to be immediately applied, or a Cataplasm of *Venice-Treacle* with the Spirit of Wine, or the Actual Cautery, leaving to the Physician's Care the Prescription of other vulnerary Remedies proper to be taken inwardly.

What is to be done to draw the Extraneous Bodies out of a Wound?

When they cannot be taken away with the Fingers or Forceps, the Patient must be set in the same Station or Posture wherein he was when he receiv'd the Wound, in order to get some farther Light to discover 'em; or else such Plaisters may be us'd as are endu'd with an attractive Quality: particularly this:

Take an Ounce of *Venice-Treacle*, half a Dram of Gum *Ammoniack*, one Dram of *Bdelium*, and two Drams of Boar's Grease, adding a Quarter of a Pound of Wax to make 'em up into the Form of a Plaister. It is reported that Hare's Grease alone hath the same Effect, and that it goes for a Secret among the Surgeons, but you may (if you please) mix it with Ointment of *Betony*. However it hath been observed that Leadn Bullets may sometimes remain in a Man's Body, during his whole Life-time without doing any harm.

How

How are Excrescences to be taken away?

They may be consum'd with Powder of *Alum*, *Unguentum Aegyptiacum*, or *Lapis Infernalis*.

After having remov'd every thing that hinders the re-uniting the Lips of Wound, what is to be done to attain thereto?

The Re-Union in Wounds is properly the Work of Nature; but it may be promoted by putting into 'em a little Balsam of Peru, and drawing together their Lips with the Fingers: Afterwards the Lips must be kept clos'd with a Bandage, a Glutinous Plaister or the dry Stitch, provided the Wound be only superficial, hindring the Air from penetrating into it. For want of *Balsam of Peru*, an excellent one may be made with the Flowers here specified.

Take the Flowers of *Henbane*, *St. John's-wort*, and *Comfrey*, and let 'em be digested in the Sun during the whole Summer-season in the Oil of Hemp-seed, which Oil, the longer it is kept proves so much the better, if it be set forth in the Sun every Summer, the Vessel that contains it being well stop'd. There is also the *Balsam of Balsams*, or the *Balsam of Paracelsus* call'd *Samech*.

To avoid the exposing of Wounds to the Air, it is requisite to cover 'em over the Dressings with some sort of Plaister, which is usually term'd the *Surgeon's Plaister*, such is that which is effectual dissolving, corroborating and allaying Pain or Inflammation.

Take the Mucilages of the Roots of great Comfrey and Fennugreek, half a Pound of Ceruse or White Lead, two Drams of Crude Opium, one Dram of Camphire, as much of Saffron, two Drams of Sandarack, one of the Oil of Bays,
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one half pound of Rosin, and as much of Turpentine and Wax. Boil all these Ingredients together in a sufficient Quantity of *Linseed Oil*, and make a Plaister according to Art.

In great Wounds it is expedient to lay over the Dressings a *Cataplasm* or *Pulvis*, such as this :

Take the Leaves and Flowers of *Camemile*, and *Melilot*, the Tops of *Wormwood*, common *Mallows* and *Marsh-Mallows*, with the Seeds of *Cummin* and *Linseed* powder'd : Then boil the whole Composition in Wine, and add thereto *Barley-Meal*, to give it a due Consistence. If there be any Cause to fear a Gangrene, you may also intermix Saffron, Myrrh, and Aloes with Spirit of Wine.

Is it necessary to put Tents into all Wounds, and to make use of Digestives and Suppuratives ?

No : it is sufficient to procure the re-uniting of the Parts simply by the means of Balsams in small Wounds ; because they ought not to be brought to Suppuration : so that Digestives and Suppuratives are only necessary in great Wounds, and those that are accompanied with Contusion, avoiding the ill Custom of some Countrey-Surgeons, that stuff up their Wounds too much with Tents and Pledgits, whereas they might well be content with simple Pledgits or flat Dossils dipt in the ordinary Digestive of Turpentine and the Yolks of Eggs with a little Brandy, or else with the Tincture of Myrrh and Aloes.

Suppuration may also be promoted by mundifying and quickening the Wound, especially if the Pledgits be steep'd in the following Composition.

Take

Take half an Ounce of Aloes and Myrrh powder'd, two Drams of *Sal Saturni*, Twenty Grains of *Sal Ammoniack*, the same Quantity of beaten Cloves, a Dram of Queen of Hungary Water, and half an Ounce of *Unguentum Basilicon*, and let the whole Mass be mingled together.

In fine, the whole Mystery consists in well cleansing the Wounds with a Linnen Cloth, or with the Injections of the Tinctures of Myrrh and Aloes; or with simple Decoctions of Wormwood, *Scordium* or Water-Germander, Bugle, Sanicle and Horehound in White-Wine; as also by prescribing the Vulnerary Decoctions of Powder of Crab's-Eyes, and *Saccharum Saturni*, to be taken inwardly, to consume the Acid Humours, which are a very great Obstacle to the speedy Cure of Wounds.

What are the vulnerary Plants, the Decoction of which is to be taken inwardly?

They are *Alchymilla* or Ladies Mantle, Ground-Ivy, *Veronica* or *Fluellin*, *St. John's-wort*, Wormwood, Centory, Bugle, Sanicle, Chervil, and others. The Decoction of Crabs may also be prescrib'd, which is an excellent Remedy, and may serve instead of a vulnerary Potion.

Sometimes Sutures or Stitches contribute very much to the re-uniting of the Lips of Wounds, when they cannot be join'd by Bandage.

C H A P. III.

Of particular Wounds of the Head.

WHAT ought first to be consider'd in a Wound of the Head?

Two things, that is to say, the Wound it self, and the Instrument with which it is was made; for by the Consideration of the Wound, we may know whether it be superficial or deep; and by that of the Instrument, we are enabl'd to make a truer Judgment concerning the Nature of the same Wound.

What is a superficial, and what is a deep Wound in the Head?

That is call'd a *Superficial Wound* in the Head, which lies only in the Skin; and that a *Deep* one which reacheth to the *Pericranium*, Skull, or Substance of the Brain.

What is to be apply'd to a Superficial Wound?

It is cur'd with a little of the *Queen of Hungary Water*; or else with a little *Balsam*, laying upon it the *Surgeon's Plaister*, or that of *Be-rony*. But if the Wound or Rent be somewhat large, it must be clos'd with a *Stitch*.

What is to be done to a deep Wound?

If it be only in the *Pericranium*, the Wound must be kept open, waiting for *Suppuration*; but if it enter the Skull, an Enquiry is to be made, whether there be a simple *Contusion*, or a *Fracture* also. In a *Contusion* it is necessary to wait for the *Suppuration*, and the *Separation* of the *Splint*.

Splinter, and to keep the VVound open ; as in a Fracture, to examine whether it be in the first Table only, or in both. It is known to be only in the first, by the Application of an Instrument, and of Ink ; as also in regard that there are no ill Symptoms : but a Fracture in both Tables shews it self by proper Signs ; that it may be found out by making a Crucial Incision in the Flesh, to discover the Fissure.

What are the Signs of a Fracture of both Tables of the Skull, and of the Effusion of Blood upon the Membranes of the Brain?

They are the Loss of the Understanding at the very Moment of receiving the VVound : an Hæmorrhage or Flux of Blood thro' the Nose, Mouth or Ears ; Dosing and Heaviness of the Head, and more especially vomiting of *Choler* ; from whence may be inferr'd the Necessity of making use of the Trepan.

What Consequence may be drawn from the Knowledge of the Instrument with which the Wound was made ?

It is according to the Quality of this Instrument ; as it is proper to cut, prick, or bruise ; if it be cutting, the VVound is more Superficial, and not subject to a great Suppuration : If it be pricking, the VVound is deeper, but of small Moment : If it be a battering or bruising Instrument, the VVound is accompanied with Contusion, producing a great Suppuration, besides the Concussion and Commotion of the Part, which must necessarily follow, and often cause very dangerous Symptoms.

Inferences may be made also from the Disposition of the wounded Person ; for a strong robust Man

Man may better bear the Stroke than a weak one; and even Anger encreases the Violence, so that all such Circumstances are not to be despis'd, in regard that they give Occasion to good Conjectures.

What particular Circumstance is there to be observ'd in undertaking the Cure of Wounds in the Face?

It is, that a more nice Circumspection is required here than elsewhere, in abstaining from Incisions, as well as in making choice of proper Medicines, which must be free from noisome Smells: And it is in this part chiefly that Balsams are to be used, avoiding Suppuration to prevent Scars and other Deformities.

CHAP. IV.

Of the particular Wounds of the Breast.

WHAT is to be observed in Wounds of the Breast?

Two things, viz. whether they penetrate into the Cavity of the Thorax or not, which may be discover'd by the Probe, and by a Wax-Candle lighted, and applied to the Entrance of the Wound, obliging the Patient to return to the same Posture wherein he received the Hurt, as also to keep his Nose and Mouth shut: For then the Flame may be perceived to be wavering, the Orifice of the Opening being full of Bubbles: A Judgment may be also made from the running out of the Blood.

What

What is to be done when it is certainly known that the Wound penetrates into the Cavity of the Breast?

It is necessary to examine what Part may be hurt by considering the situation of the Wound, and its Symptoms: If the Lungs are pierc'd, a spitting of frothy Vermilion-colour'd Blood ensues, with difficulty of Respiration, and a Cough. If any of the great Vessels are open'd, the wounded Person feels a weight at the bottom of his Breast, is seiz'd with cold Sweats, being scarce able to fetch his Breath, and vomits Blood, some Portion whereof issueth out of the Wound. If the *Diaphragm* or Midriff be cut in its Tendinous Part, he is suddenly hurried into Convulsions: And if the Heart be wounded either in its *Basis* or *Ventricles*, he falls into a Swoon and dies incontinently.

But if the Probe doth not enter, and none of the above mention'd Symptoms appear, it may be taken for granted, that the Wound is of no great consequence.

What is to be done when the Wound penetrates into the Chest, yet none of the Parts are hurt; only there is an Effusion of Blood over the Diaphragm?

It is necessary to make an *Empyema*, for otherwise the extravasate Blood in corrupting, would inevitably cause an Inflammation, Gangrene, and kill the Patient.

What is an Empyema?

It is an Operation whereby any sorts of Matter are discharg'd with which the *Diaphragm* is loaded, by making a Perforation or Opening in the Breast.

C H A P. V.

Of the particular VVounds of the lower Belly.

WHAT is to be done to know the Quality of a VVound made in the lower Belly?

It is requisite to make use of the Probe, to observe the situation of the VVound, and to take notice of all the Symptoms: For by the help of the Probe, one may discover whether it hath penetrated into the Cavity or not, after having enjoyn'd the Patient to betake himself to the same Posture wherein he was when he first received the VVound: By its situation, a Conjecture may be made that such a particular Part may be hurt, and by a due Examination of the Symptoms, one may attain to an exact Knowledge. As for Example: It is known that one of the thick Guts is open'd, when the Hurt is found in the *Hypogastrium*, and the Excrements are voided at the VVound: As it is certain that one of the thin Guts is pierc'd, when the VVound appears in the Navel, and the Chyle issueth forth from thence: And so of the others.

What Method ought to be observ'd in curing VVounds in the lower Belly?

It is expedient at first to prevent letting in the Air, and to dilate the VVound, in order to sow up the perforated Gut, and afterward to

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restore it to its Place ; as also to tie the Caul, which hangs out of the Orifice, and to cut it off, lest in putrifying it should corrupt the neighbouring Parts. Then these Parts may be bath'd with Lees of Wine, wherein have been boil'd the Flowers of Camomile and Roses with Wormwood : The Powders of Aloes, Myrrh and Frankincense may be also sprinkled on them ; and the Wound must be sowed up again to dress it on the Outside, the Patient in the mean time being restrain'd to a regular Diet. But Clysters must be forborn on these Occasions, especially when one of the thick Guts is wounded, making use rather of a Suppository or laxative Diet-Drinks, to avoid Dilatation and Straining.

CHAP. VI.

Of Wounds made by Guns or Fire-Arms.

IN these Wounds there is always Contusion, Laceration with loss of Substance, and often the Fracture and Shattering of a Bone. They are red, black, livid, and inflam'd, not being usually accompany'd with an Hæmorrhage : They are generally round, and streighter at their Entrance than at their Bottom ; at least, if they were not made with cross-bar Shot, or Quarter-pieces.

Of the Prognostick of Wounds by Gun-shot.

When these Wounds penetrate into the Substance of the Brain, or Spinal-Marrow, or into the Heart, Pericardium, great Vessels and other noble Parts, Death always inevitably follows; and often happens at the very Instant. But one may undertake the Cure of those that are superficial, and which are made in the Neck, Shoulders, Arms, and all other Parts of the Body.

Of the Cure of Wounds by Gun-shot.

For the better curing of these sorts of Wounds, it is requisite to be informed of the Quality of the Fire-Arms by which the Wounds were made, in regard that a Musquet is more dangerous than a Pistol, and a Cannon much more than a Musquet; as also to examine their situation and concomitant Accidents: for by how much the more complicated they are, so much the greater is the Danger. Then the Patient must be set (as near as can be) in the very same Situation and Posture wherein he remain'd when the Wound was receiv'd, in order to discover the direct Passage of the Wound by the Help of the Probe, with which a search is to be made, whether a Bullet or any other extraneous Bodies, as Wood, Flocks, Linnen, or Stuff as yet stick in the Wound: so that Endeavours may be us'd to take them out through the same Hole where they are enter'd, Care being more especially had to avoid making Dilacerations

lacerations in drawing them out : But if the Operator hath endeavour'd to no purpose to remove these extraneous Bodies, let him make a counter-opening in the opposite Part, where he shall perceive any Hardness, nevertheless without touching the Vessels : Thus the Incision being made, he may readily draw them out with his Fingers, or some other Instrument.

If the Bullet is lodg'd so far in a Bone that it can't be taken away without breaking the same Bone, it is more expedient to let it lie there : but if the Leg or Arm-bones are very much split or shatter'd, then the Amputation of 'em becomes absolutely necessary. The Pain and Inflammation of the Part may be asswag'd by letting Blood, topical Anodines, cooling Clysters and Purgations : But in case much Blood hath been already lost, Phlebotomy must be omitted. The Clysters may be made with Decoctions of *Mercury*, *Mallows*, *Beets*, a handful of *Barley* and *Honey* of *Roses*.

Some Surgeons are of opinion that the Patient ought to be purged every other Day, and even on the very same Day that he received the Wound, if his Strength will permit : However very gentle Purges are to be us'd upon this Occasion, such as *Cassia*, *Manna*, *Tamarins*, *Syrup* of *Viols*, and that of white *Roses*.

In the mean while Anodines may be used to mitigate the Pain : as Cataplasms, or Pultisses made with the Crum of white Bread, Milk, Saffron, the Yolk of an Egg, and Oil of *Roses* applied hot : which last Ingredient is of it self a very good Anodine. But to assuage great Inflammations, Oil of *Roses*, the White of

an Egg and Vinegar beaten all together, may be laid on the neighbouring Parts.

At first it is necessary to apply spirituous Medicines to the Wound, and Pledgets steep'd in Spirit of Wine camphorated, are admirable for that purpose; but if there be a Flux of Blood, styptick Waters, or other astringent Remedies may be us'd, still remembering that all these Medicaments must be apply'd hot.

To promote the Suppuration of these contused Wounds, a Digestive may be made of *Oleum Rosatum*, the Yolk of an Egg and *Venice Turpentine*.

If the Wound be in the Nerves, Tendons, or other Nervous Parts, it is requisite to use spirituous and drying Medicines, never applying any Ointments, which will not fail to cause Putrefaction in those Parts: But a Cataplasm may be made with Barley Meal, *Orobanch*, Lupins and Lentils boil'd in Claret, adding some Oil of *St. John's-Wort*.

The Balsam of *Peru*, Oil of Turpentine distilled, Oil of Wax, distill'd Oil of Lavender, *Oleum Philosophorum*, Oil of Bays distill'd, Balsam of *St. John's-Wort*, Spirit of Wine and Gum *Elemi*, are excellent Medicaments for the Nerves: Or else,

Take four Ounces of *Unguentum Althae* with a Dram and a half of Chymical Oil of Bays; mingle the whole Composition, and apply it: Or else,

Take an Ounce of distill'd Oil of Turpentine, a Dram of Spirit of Wine, and half an Ounce of Camphire; let all be mixt and dropt into the Wound: Or else,

Take

Take a Scruple of *Euphorbium*, half an Ounce of *Colophonia*, and a little Wax; let 'em be mingl'd together, and apply'd very hot to the Nervous Parts.

If the Wounds are deep, Injections may be made with this Vulnerary Water, which is very good for all sorts of Contusions, as also for the Gangrene and Ulcers.

Take the lesser Sage, the greater Comfrey, and Mugwort, of each Four Handfuls; Plantane, Tobacco, Meadowsweet, Betony, Agrimony, Vervein, *St. John's-wort*, and Wormwood, of each Three Handfuls; Fennel, Pilewort, Bugle, Sanicle, Mouse-Ear, the lesser Dastie, the lesser Centory, and All-heal, of each Three Handfuls; Three Ounces of round Birth-wort, and Two Ounces of long: Let the whole Composition be digested during thirty Hours in Two Gallons of good white Wine, and afterwards distill'd in *Balneo Maria*, till one third part be consum'd.

If a Gangrene happens in the Part, Spirit of Mother-wort may be applied to it, which is made with two Drams of Mastick, Myrrh, *Olibanum*, and Amber, and a Quart of rectify'd Wine, the whole being distill'd.

This Fomentation may be apply'd very hot to very good purpose, viz. an equal Quantity of Camphorated Wine, and Lime-Water, with three Drams of Camphire.

This is also an Excellent Cataplasme: Take a Pint of Lye, and as much Spirit or Wine, half an Handful of Rue, Sage, *Sordiam*, and Wormwood, a Dram of each of the Roots of both sorts of Birth-wort, and two Drams of

Sal Ammoniack, Let the whole Composition be boil'd till a Third part be consum'd ; adding half a Dram of Myrrh and Aloes, and a little Brandy.

Of a Burn made by Gun-powder.

If the Burn be recent, and the Skin not ulcerated, Spirit of Wine or Brandy is to be immediately apply'd ; or else an Ointment may be made with Oil of Olives, or bitter Almonds, Salt, the Juice of Onions, and Verjuice.

If the Skin be ulcerated, and little Blisters or Pustules arise, an Ointment may be compounded with the second Bark of Elder boiled in Oil of Olives. After it hath been strained, add two parts of Ceruse or white Lead, and one of burnt Lead, with as much Licharge, stirred about in a Leaden Mortar, as will make a Liniment. But it is not convenient to take out the Grains of Powder that remain in the Skin, because they are apt to break, and to be more confounded or spread abroad ; so that they must be left to come forth in the Suppuration.

When the Wound is superficial, and the Skin as yet whole, pounded Onions with common Hony are an excellent Remedy ; but if the Skin be torn, it is not to be us'd, by reason that the Pain wou'd be too great ; in which case Oil of Tartar *per deliquium* hath a very good Effect.

If the Burn be accompanied with a Fever, it may be allay'd with fixt Nitre, Nitre prepar'd with Antimony, and Gun-powder taken in-

inwardly, which are very effectual in their Operation. Crab's Eyes prepared, and even some of 'em unprepared, are in like manner admirable Remedies.

As for external Medicaments, when the Burn is only superficial, take Onions and unslack'd Lime, quench'd in a Decoction of Rapes, and apply this Liquor very hot, with double Compresses dipt therein. Or else take what Quantity you please of quick Lime well wash'd, and beat it in a Leaden Mortar, with May-Butter without Salt, to make an Ointment, which may be laid altogether liquid upon the affected Part: Or else,

Take as much quick Lime as you can get up between your Fingers at two several times; Milk-Cream and clarify'd Honey, of each about half the like Quantity; let the whole be intermixed to the Consistence of an Ointment, and apply'd: It is an excellent Remedy. The following one is incomparable:

Take unslack'd Lime, and put it into common Water, so as the Water may rise four or five Fingers breadth above it. After the Effervescence pour in Oil of Roses; whereupon the whole Mass will be coagulated in form of Butter, and may be apply'd.

A good Lotion may be prepared with the Juice of Garlick and Onions, in recent Burns; or make use of this Ointment. Take an Ounce and an half of raw Onions, Salt and Venice Soap, of each half an Ounce; mingle the whole Composition in a Mortar, pouring upon it a sufficient quantity of Oil of Roses: Or else,

Dissolve *Minium* or *Litharge* in *Vinegar*, filtrate this *Liquor*, and add thereto a quantity of *Rape-Oil* newly drawn off, sufficient to give it the Consistence of a liquid *Liniment*; then stir it about in a *Leaden Mortar* till it become of a grey Colour, and keep it for use as an excellent *Liniment*: Or else,

Pound *Crey-Fishes* or *Crabs* alive in a *Mortar* to get their *Blood*, and foment the Part with it hot; it is a good *Remedy*: Otherwise intermix the pounded *Crabs* with *May-butter* without *Salt*, and let 'em be boil'd up together, and scumm'd, till a red *Ointment* be made, which may be drawn off, and strain'd for use. And indeed, all *Medicinal Compositions* wherein *Crabs* are an *Ingredient*, are true *Specificks* against *Burns* made by *Gunpowder*.

The *Mucilages* of the *Seeds* of *Psyllium*, or rather those of *Quince-Seeds* prepar'd with *Frog's Sperm*, and a little *Saccharum Saturni*, spread with a *Feather* upon the affected Part, have a wonderful *Operation* in *Burns*.

A *Medicament* compounded with one third part of the *Oil* of *Olives*, and two of the *Whites* of *Eggs* well beaten and mixt together, is a very simple and singular *Remedy*. Otherwise take half an *Ounce* of *Linseed Oil* infused in *Rose-Water*, with four *Yolks* of *Eggs*; beat 'em together, and let the whole be apply'd to the burnt Part.

If the *Burn* be very violent, and hath many *Pustules*, *Etmullerus* is of *Opinion* that they ought to be open'd, and that an *Ointment* should be apply'd, which is made of *Hen's Dung*

Dung boiled in fresh Butter : Otherwise,

Take a handful of fresh Sage-Leaves, two handfuls of Plantane, six Ounces of fresh Butter without Salt, three Ounces of Puller's-Dung newly voided, and the whitest that can be found; then fry the whole Composition for a quarter of an Hour; squeeze it out, and keep it for use : Otherwise,

Take two Ounces of sweet Apples roasted under Embers, Barly-Meal, and Fennegreek, of each half an Ounce, and half a Scruple of Saffron; let the whole Mass be mingled to make a Liniment or soft Cataplasim, which may serve to assuage Pain, and mollifie the Skin.

If the Wound be yet larger, and hath a Scab, open all the Pustules, and endeavour the two first Days to cause the Escar to fall off by the Application of a Liniment made of the Mucilages of Quince-Seeds steeped in Frog's-Sperm, with fresh Butter, the Oil of White Lillies, and the Yolk of an Egg : Otherwise,

Make a Liniment with fresh Butter well beaten in a leaden Mortar, with a Decoction of Mal-lows, which being spread upon hot Colewort Leaves, and apply'd to the Elcar, will hasten its Separation.

But if the Escar be too hard and obstinate, it is requisite to proceed to Incisions to make way for the *Sanies*, lest a deep and putrid Ulcer should be engender'd Underneath. As soon as the Humour is evacuated, the abovemention'd Emollient Medicines may be us'd, till the separation; then the Ulcer may be consolidated with

Digestives and Mundificatives ; such as the Ointment of Quick Lime with Oil of Roses, and the Yolks of Eggs. The white camphorated Ointments, and that of Alabaſter, are alſo good for the ſame Purpoſe.

If a Gangrene enſueth, Sudorificks muſt be taken inwardly ; ſuch are camphorated Spirit of Treacle, the Eſſence and Spirit of Elder-berries, the Spirit of Hart's Horn with its own proper Salt, Venice-Treacle in Spirit of Wine, camphorated or the diſtilled Water of Scorpion Water, Hart's Horn, Citron with Camphire, &c.

As for external Remedies in the beginning of the Gangrene, Spirit of Wine apply'd hot is excellent ; and yet better if Aloes, Frankincenſe, Myrrh be infus'd therein. It ought alſo to be obſerved, that Camphire muſt always be mingled in the topical Medicines for the Cure of a Gangrene.

A Decoction of unſlack'd Lime, in which Brimſtone hath been boil'd, with *Mercurius Dulcis*, and Spirit of Wine, is a very excellent Remedy.

In a conſiderable Gangrene, after having a made deep Scarifications, let Horſe Dung be boil'd in Wine, and laid upon the Part in Form of a Cataplaſm. This is an approved Remedy.

If a *Sphacelus* be begun, ſcarifie the Part, and apply thereto abundance of *Unguentum Egyptiacum* over and above the Ointments and Cataplaſms already deſcrib'd ; remembring always, that when the Gangrene degenerates into a *Sphacelus*, all the mortify'd Parts muſt be incontinently ſeparated or cut off from the ſound.

CHAP. VII.

Of Ulcers in general.

What is an Ulcer?

An Ulcer is a Rupture of the natural Union of the Parts made a long while ago, which is maintain'd by the *Sanies* that runs out of its Cavity; or an Ulcer takes its Rise from a Wound that could not be well cur'd in its proper time, by reason of the ill Quality of its *Pus* or corrupt Matter.

What difference is there between a Wound and an Ulcer?

It is this, that a Wound always proceeds from an external Cause, and an Ulcer from an internal, such as Humours that fall upon a Part; or else a Wound by long remaining open degenerates into an Ulcer.

Whence is the difference of Ulcers deriv'd?

It is taken from the Causes, that produce 'em. and the Symptoms or Accidents with which they are accompanied. Thus upon account of their Causes they are call'd Benign or Malignant, Great, Little, Dangerous, or Mortal; and by reason of their Accidents, they are term'd Putrid, Corrosive, Cavernous, Fistulous, Cancerous, &c.

Do Ulcers always proceed from external Causes, or from an outward Wound degenerated?

No

No, they sometimes also derive their Origine from internal Causes, as the Acrimony of Humours, or their Malignant Quality; the Retention of a Splinter of a Bone, and other things of the like Nature. These Ulcers are commonly Primitive, and the others Degenerate.

What are Putrid, Corrosive, Cavernous, Fistulous and Cancerous Ulcers?

The Putrid Ulcer is that wherein the Flesh is soft and crusty, the Pus and Ichor being viscous, stinking, and of a cadaverous smell.

The Corrosive Ulcer is that which by the Acrimony and Malignity of its Sanies, corrodes, makes hollow, corrupts and mortifies the Flesh.

The Cavernous Ulcer is that the Entrance of which is streight and the bottom broad, wherein there are many Holes fill'd with malignant Sanies, without any callosity or hardness in its sides.

The Fistulous Ulcer is that which hath long, streight, and deep Holes, with much hardness in its sides; the Sanies whereof is sometimes virulent, and sometimes not.

The Cancerous Ulcer is large, having its Lips swoln, hard, and knotty, of a brown Colour, with thick Veins round about, full of a livid and blackish sort of Blood. In the bottom are divers round Cavities, which stink extremely, by reason of the ill Quality of the Sanies that runs out from thence.

Are there no other kinds of Ulcers?

Yes, there are also Verminous, Pocky, Scorbutick, those call'd *Chiroria* and *Telephia*, and others, which have much affinity with, and may well

well be reckon'd among the five Kinds already specify'd,

What are the means to be us'd in the curing of Ulcers?

Ulcers ought to be well mundify'd, dry'd and cicatriz'd: but with respect to the several Causes and Accidents that render 'em obstinate, and difficult to be cur'd, it is also requisite to make use of internal Medicines, which may restrain and consume 'em. If their sides grow callous, they are to be scarified, in order to bring 'em to Suppuration; and if there be any Excrescences, they must be eaten away with corrod'g Powders, such as that of Allom; or by proper Causticks.

What are the Remedies proper to cleanse and dry up Ulcers?

To this purpose divers sorts of Liquors may be us'd, as also Powders and Plaisters: The Liquors are usually made of Briony-Roots, the greater Celandine, Lime, and the Yellow Water; a Tincture of Myrrh, Aloes and Saffron, and Whey, whereto is added *Saccharum Saturni*; and the Ulcers may be wash'd or bath'd with these Liquors; and very good Injections be compounded of 'em.

The Powders are those of Worm-eaten Oak, Allom, and Cinnabar, the last of these being us'd by throwing them upon Fire, and causing the Fume to be convey'd to the Ulcer thro' a Funnel. The Country People often make use of Potter's Earth to dry up their Ulcers, with good Success; but then they must not be of a Malignant Nature.

The

The Plaisters are *Emplastrum de Betonica*, *Dissulphuris*, *Dessiccativum Rubrum*, and others; and the Ointments are such as these:

Take three Yolks of Eggs, half an Ounce of Honey, and a Glass of Wine, and make thereof a mundifying Ointment, according to Art: Otherwise,

Take Lime well wash'd, and dry'd several times; let it be mingled with Linseed Oil and Bole, and it will make an excellent Ointment to mundifie and dry; a little *Mercury Precipitate* may be intermixt (if you please) to augment the drying Quality; and *Mercurius Dulcis* may be added in the Injections.

For Ulcers in the Legs, and Cancerous Ulcers, take Plantain Water and Allom Water, or else Spirit of Wine, *Unguentum Egyptiacum*, and Venice-Treacle; or else an Extract of the Roots of round Birth-Wort made in Spirit of Wine. Gunpowder alone dissolv'd in Wine, is of singular use to wash the Ulcers, and afterwards to wet the Pledegts which are to be apply'd to 'em. But here are two particular and specifick Medicines to mollifie a Cancer.

Take *Saccharum Saturni*, Camphire, and Sugar; let 'em be incorporated with the Juice of House-Leek and Plantain, in a Leaden Mortar; then make a Liniment thereof, and cover the Part affected as lightly as is possible to be done, as with a simple Flaxen Cloth, or a Sheet of Cap Paper: Or else,

Take the distill'd Water of rotten Apples, and mingle it with the Extract of the Roots of round Birth-Wort made in the Spirit of Wine, reserving

reserving this Liquor to wash the Part, and to make Injections.

C H A P. VIII.

Of Venereal Diseases.

Of the Chaude-pisse or Gonorrhœa.

THE Signs of this Disease are a painful Distention of the *Penis* or *Yard*, and a scalding Pain in making Water, the Urine being pale, whitish, and full of Filaments or little Threads: Sometimes the Testicles are swell'd as well as the *Glans* and *Præputium*; and sometimes there is a Flux of a kind of Matter yellowish, Greenish, &c.

If there be a great Inflammation in the *Yard*, Endeavours must be us'd to allay it by letting Blood; and afterward the Patient may take a cooling and diuretick Diet-Drink, as also Emulsions made with cold Seeds in Whey. A very good Decoction may be prepar'd in all places, and without any trouble, by putting a Dram of *Sal Prunella* into every Quart of Water, whereof the Patient is to drink as often as he can: This Decoction is very cooling and diuretick; and the use of it ought to be continued till the Inflammation be asswaged. Then some gentle Purges are to be prescrib'd in the beginning, such as an Ounce of *Cassia*, and as much *Manna*.

na, dissolved in two Glasses of Whey, which are to be taken one or two Hours one after another.

Afterward the Patient must be often purg'd with twelve Grains of Scammony, and fifteen Grains of *Mercurius Dulcis*; and these Purgations must be continued, till it appears that the Fluxes are neither yellowish nor greenish, nor of any other bad Colour. When they are become White, and may be drawn into a Thread, they may be stop't with Astringents: Amber and dry'd Bones beaten to Powder, eighteen Grains of each, with one Grain of *Laudanum*, the whole Composition being taken in Conserve of Roses, are very good for this purpose. *Crocus Martis Astringens*, or else its Extract, taken from half a Dram to a whole Dram, in like manner performs the same Operation. As soon as the *Gonorrhœa* is stop't, to be certain of a perfect Cure, a Dram of the *Mercurial Panacea* is to be taken, from fifteen to twenty Grains at a time, in Conserve of Roses. In the mean while if a small Salivation should happen, it must be let alone for the present, since it may be stop't at pleasure by Purgations. When it is requisite to restrain the *Gonorrhœa*, *Mercury* must not be given any longer, in regard that it is a Dissolvent, which is only good when the Glandules of the Groin or Testicles are swell'd, or else when it is expedient to set the *Chaudépisse* a running, after it hath been too suddenly stop't. At the same time that the Astringents are taken with the Mouth, Injections are also to be made into the Yard; such as are prepar'd with *Lapis Medicamentosus*, of which one Dram is put into eight

eight Ounces of Plantain Water. All Astringents that are not Causticks, are proper for the Syringe.

Of Shankers.

They are round Ulcers, and hollow in the middle, which appear upon the *Glans* and the *Præputium*. To cure 'em, they must be touch'd with the *Lapis Infernalis*, and brought to Suppuration by the means of red Precipitate mixt with the Ointment of *Andreas Crucius*. *Oleum Mercurii* laid on a Pledger or Bolster, is very good to open Shankers, and consume their Flesh. The Patient must be well purg'd with *Mercurius Dulcis* and Scammony, taking twelve or fifteen Grains of each in Conserve of Roses; and after these Purgations are sufficiently repeated, he may take the *Mercurial Panacea*. It is an excellent Remedy for all sorts of Pocky Distempers not yet consummated, or arriv'd at the greatest height of Malignity.

Of Bubo's.

Bubo's are gross Tumours or Abscesses that arise in the Groin, the perfect Maturity of which is not to be waited for in order to open 'em; because it is to be fear'd, lest the corrupt Matter remaining therein too long, might be convey'd into the Blood by the Circulation, and to produce the grand Pox; Therefore it is necessary to open 'em betimes with a Lancet, or else with Causticks, if they are too hard. They ought to

to be suppurated for a considerable time : The Patient must be well purg'd with Scammony and *Mercurius Dulcis* : He must also take the *Mercurial Panacea's*.

Of the Pox.

This loathsome Disease begins sometimes with a virulent *Gonorrhœa*, and a weariness or faintness at the same time seizeth on all the Members of the Body : It is usually accompanied with Salivation and the Head-ach, which grows more violent at Night : Pricking Pains are also felt in the Arms and Legs, the Palate of the Mouth being sometimes ulcerated. If it be an inveterate Pox, the Bones are corrupted, and *Exostoses* happen therein ; divers Spots with dry, round and red Pustules appear in the Skin, and the Cartilages or Gristles of the Nose are sometimes eaten up. But when this Disease is come to its greatest height of Malignity, the Hair falls off ; the Gums are ulcerated ; the Teeth are loose, and drop out ; the whole Body is dry'd up ; the Eyes are livid ; the Ears tingle ; the Nose becomes stinking ; the Almonds of the Ears swell ; the *Uroula* or Palate is down ; Ulcers break out in the Privy Parts ; Bubo's arise in the Groin ; as also Warts in the *Glans* and *Preputium* ; and *Condyloma's* in the *Anus*.

Indeed the Pox may be easily cur'd in the beginning ; but when it hath taken deep Root by a long continuance, it is not extirpated without much difficulty, more especially if it be accompany'd with Ulcers, Caries, and *Exostoses* ; the

the Person afflicted with it having an ill Constitution, and his Voice grown hoarse.

The Spring and Summer are the proper Seasons of the Year for undertaking the Cure of this Disease: In order to which it is necessary that the Patient begin with a regular Diet, lodging in a warm place, and taking such Aliments as yield a good Juice; as Jelly-broath made with boild Fowl: Let him drink Sudorifick Decoctions, prepar'd with the Wood of *Guayacum*, *China-Root*, and *Sarsaparilla*, and let him abstain from eating any thing that is high season'd: Let him take Clysters to keep his Body open; sometimes also he may be let Blood, and purg'd with half a Dram of *Jalap*, and fifteen Grains of *Mercurius Dulcis*. The Purgations may be repeated as often as it shall be judg'd convenient; and then the Patient may be bath'd for nine or ten Days, every Morning and Evening; during which time he may take volatile Salt of Vipers, the Dose being from six to sixteen Grains; or else Viper's Grease from half a Dram to a whole Dram in Conserve of Roses.

Afterward it will be necessary to proceed to Fluxing, by Frictions with *Unguentum Mercurii*, which is made of crude *Mercury* stirr'd about in a Mortar with Turpentine, and then the whole mingled with Hog's Grease, one part of *Mercury* being usually put into two parts of Hog's Grease. The Rubbing is begun at the Sole of the Feet, ascending to the Legs, and the inside of the Thighs; but the Back-Bone must not be rubb'd at all. When the Persons are tender, or of a weak

weak Constitution, a single Friction may be sometimes sufficient. Thus the Patient must be rubb'd at the Fire, after he hath taken a good Mess of Broth; but I would not advise it to be done with more than one or two Drams of *Mercury* at a time, without reckoning the other Ingredients. Then the Patient must be dress'd with a Pair of Linnen Drawers, and laid in his Bed, where his Mouth may be looked into from time to time, to see whether the *Mercury* hath taken effect; which may be easily known, by reason that his Tongue, Gums and Palate swell, his Head akes, his Breath is strong, his Face red, and he can scarce swallow his Spittle; or else he begins to salivate.

If none of these Signs appear, the Rubbing must be begun again in the Morning and Evening: Then if no Salivation be perceiv'd, for sometimes four or five Frictions are made successively, a little *Mercurial Panacea* may be taken inwardly, to promote it. During the Frictions, the Patient is to be nourish'd with Eggs, Broths, and Gellies: He must also keep his Bed in a warm Room, and never rise till it shall be thought fit to stop the Salivation, which continues Twenty or Twenty five Days: or rather till it becomes Laudable; that is to say, till it be no longer stinking nor coloured, but clear and fluid.

If a Looseness should happen during the Salivation, it would cease; so that to renew it, the Looseness may be stay'd with Clysters made of Milk and the Yolks of Eggs: And in case the Salivation should not begin afresh, it must be excited with a slight Friction: But if it should

shou'd be too violent, it may be diminish'd by some gentle Purge, or with four or five Grains of *Aurum Fulminans*, taken in Conserve of Roses.

Three or Four Pints of Rheum are commonly salivated every Day in a Basin made for that purpose, which the Patient holds in his Bed near his Mouth, so as the Spittle may run into it. But if the Fluxing shou'd not cease of it self at the time when it ought, he must be purg'd to put a stop thereto. If any Ulcers remain in his Mouth, to dry them up, Gargarisms are to be often us'd, which are made of Barley Water, Honey of Roses or Luke-warm Wine.

The Warts are cured by tying them, if a Ligature be possible: or else they may be consum'd with Causticks, such as the Powder of Savine, or *Aqua fortis*, taking care to preserve the neighbouring Parts: Sometimes they are cut, left to bleed for a while, and bathed with warm Wine.

When the Patient begins to rise, he must be purg'd, his Linnen, Bed and Chamber being chang'd; and afterward his strength is to be recruited with good Victuals and generous Wine. If he were too much weaken'd, let him take Cow's Milk with *Saccharum Rosatum*.

If the Pox were not inveterate, the Fluxing might be excited by the *Panacea* alone, without any Frictions: For after the Phlebotomy, Purgations and Bathings duly administred the Patient might take Ten Grains of this in the Morning, and as many at Night; on the next Day Fifteen Grains might be given, and the like Quantity

Quantity at Night; on the Third Day Twenty Grains might be given both Morning and Evening: on the Fourth Day Twenty five Grains in the Morning, and as many at Night; and on the Fifth Day Thirty Grains in the Morning, and the very same Quantity in the Evening, continuing thus to augment the Dose, till the Fluxing comes in abundance: And it may be maintain'd by giving every two or three Days Twelve Grains of the same. This course must be continually follow'd till the Salivation becomes Laudable and the Symptoms cease.

The manner of making the Mercurial Panacea.

To prepare this Panacea, it is requisite to take Mercury reviv'd from Cinnabar, because it is more pure than that which is immediately dug out of the Mine. The Mercury is prepar'd after this manner: Take a Pound of artificial Cinnabar pulveriz'd, and mingled exactly with Three Pounds of unslack'd Lime, in like manner beaten to Powder: Let this Mixture be put into a Retort of Stone, or Glass luted, the Third part of which at least remains empty: Let it be plac'd in a reverberating Furnace; and after having fitted a Recipient fill'd with Water, let the whole be left during Twenty four Hours at least: Then let the Fire be put under it by degrees, and at length let the Heat be very much augmented, whereupon the Mercury will run drop by drop into the Recipient: Let the Fire be continu'd till nothing comes forth, and the Operation will be perform'd generally in six or seven Hours;

Hours: Then pour the Water out of the Re-
cipient, and having wash'd the Mercury, to
cleanse it from some small Quantity of Earth
that may stick to it, let it be dry'd with
Clothes, or else with the Crum of Bread:
Thus Thirteen Ounces of Mercury may be
drawn off from every Pound of artificial Cin-
nabar.

The *Panacea* is made of *Mercurius Dulcis*,
and this of Corrosive Sublimate: To make
the Corrosive Sublimate, put Sixteen Ounces
of Mercury reviv'd from Cinnabar, into a Ma-
trass; pour upon it Eighteen Ounces of Spirit
of Nitre; place the Matrass upon the Sand, which
must be somewhat hot, and leave it there till the
Dissolution be effected: Then pour off this
Liquor, which will be as clear as Water;
into a Glass Vial, or into a Stone Jug, and let
its Moisture evaporate gently over a Sand-
Fire, till a white Mass remains; which you
may pulverize in a Glass Mortar, mingling it
with Sixteen Ounces of Vitriol calcin'd, and as
much decrepitate Salt: Put this Mixture into a
Matrass, two third Parts of which remain empty,
and the Neck of which hath been cut in the
Middle of its Height; then fix the Matrass in the
Sand, and begin to kindle a gentle Fire under-
neath, which may be continued for three Hours;
afterwards let Coals be thrown upon it till the
Fire burn very vehemently, and a Sublimate
will arise on the Top of the Matrass; so that
the Operation may be perform'd within the
space of Six or Seven Hours. Let the Matrass
be cool'd and afterward broken; avoiding a
kind of Flower or light Powder, which flies
up

up into the Air as soon as this Matter is removed; whereupon you'll find Nineteen Ounces of very good corrosive Sublimate; but the red *Scoria* or Dross which settleth at the bottom must be cast away as unprofitable. This Sublimate being a powerful *Escarotick*, eats away proud Flesh, and is of singular Use in cleansing old Ulcers. If halfe a Dram thereof be dissolv'd in a Pint of Lime-Water, it gives a yellow Tincture, and this is that which is call'd the *Phagedonic Water*.

The sweet Sublimate of which the *Panacea* is immediately compos'd, is made with sixteen Ounces of Corrosive Sublimate, pulveriz'd in a Marble or Glass Mortar, intermixing with it by little and little, twelve Ounces of Mercury reviv'd from Cinnabar: Let this Mixture be stirr'd about with a wooden Pestle, till the Quick-silver become imperceptible; then put the Powder, which will be of a grey Colour, into divers Glass Vials, or into a Matraass, of which two third Parts remain empty; place your Vessel on the Sand, and kindle a small Fire in the beginning, the Heat of which may be afterward encreas'd to the Third Degree: Let it continue in this Condition till the Sublimate be made; and the Operation will be generally consummate in Four or Five Hours: Whereupon you may break your Vial, and throw away as useless, a little light Earth that lies at the bottom. You must also separate that which sticketh to the Neck of the Vials, or of the Matraass, and keep it for Ointments against the

Itch

Itch; but carefully gather together the white Matter which lies in the middle, and having pulveriz'd it, cause it to be sublimated in the Vials or Matrafs, as before. This Matter must also be separated again (as we have already shewn) and put into other Vials to be sublimated a third time. Lastly, the Terrestrial Parts in the bottom, and the Fuliginous in the Neck of the Vials, must be, in like manner, separated, still preserving the Sublimate in the middle, which will then be very well dulcified, and amount to the Quantity of Twenty five Ounces and an half: It is an Efficacious Remedy for all sorts of Venereal Diseases; removes Obstructions, kills Worms, and purgeth gently by Stool, being taken in Pills, from six Grains, to Thirty.

Of the proper Composition of the Mercurial Panacea.

Take what Quantity you please of sweet Sublimate, reduce it to Powder in a Marble or Glass Mortar, and put it into a Matrafs, three quarters whereof remain empty, and of which you have cut off the Neck in the middle of its Height: Then place this Matrafs in a Furnace or *Balneum* of Sand, and make a little Fire underneath for an Hour, to give a gentle Heat to the Matter, which may be augmented by little and little to the third Degree: Let it continue in this state about five Hours, and the Matter will be sublimat.d within that space of time

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Then

Then let the Vessel cool, and break it, throwing away as unprofitable, a little light sort of Earth, of a reddish Colour, which is found at the bottom, and separating all the Sublimate from the Glass. Afterward pulverize it a second time, and let it be sublimated in a Matrass, as before : Thus the Sublimations must be reiterated seven several times, changing the Matrasses every time, and casting away the light Earth. Then having reduced your Sublimate to a very fine impalpable Powder, by grinding it upon a Porphyry or Marble Stone, put it into a Glass Cucurbite, pour into it alkaliz'd Spirit of Wine to the Height of four Fingers ; cover the Cucurbite with its Head, and leave the Matter in Infusion during fifteen Days, stirring it about from time to time with an Ivory *Spatula*. Afterward set your Cucurbite in *Balneo Mariae*, or in a vaporous Bath, make fit a Recipient to the Mouth of the Alembick ; lute the Joints exactly with a moisten'd Bladder, and cause all the Spirit of Wine to be distill'd with a moderate Fire : Let the Vessels be cool'd, and unluted, and the *Pannacea* will appear at the bottom of the Cucurbite. If it be not already dry enough, you may dry it up with a gentle Fire in the Sand, stirring it with an Ivory or wooden *Spatula* in the Cucurbite it self till be reduc'd to Powder. It may be kept for use in a Glass Vessel, as a Remedy of very great Efficacy for all sorts of Venereal Diseases, as also for Obstructions, the Scurvy, *Scrophula* or King's-Evil, Tetter, Scab, Scurf, Worms, *Ascari-des*, inveterate Ulcers, &c. The Dose is from six Grains to two Scruples, in Conserve of Roses.

A

TREATISE

OF THE

DISEASES

OF THE

BONES.

CHAP. I.

Of the Dislocation of the Bones.

WHAT are the Diseases incident to the Bones?

They are five in number, viz. Dislocation, Fracture, Caries or Ulcer, Exostosis and Nodus.

What is a Dislocation or Luxation?

It is the slipping of the Head of one Bone out the Cavity of another, with an Interdiction,

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which

which disables the Part from performing its natural Motion: Or else it is the disjoining of two Bones united together for the Motion of a Part.

How many Causes are there of Dislocation in general?

Two, that is to say, one violent and the other gentle; thus the Dislocation is made violently in Falls, Strains, Knocks and Blows; but it is done gently and slowly by a Fluxion of Humours, as well as by a gradual Collection of 'em between the Joints, and the Ligaments, the Relaxation or Loosening of which gives occasion afterward to the Head of the Bone to go out of its Place; whence this Consequence may well be drawn, *viz.* That a violent Dislocation usually depends upon an external Cause, and a slow one upon an internal.

After how many manners doth a Dislocation happen?

Two several Ways; *viz.* the first is called compleat, total, and perfect; and the second incompleat, partial and imperfect: But both may happen before, behind, on the inside, and without; and may also be simple or complicated.

What are the Signs of a perfect, total, and compleat Dislocation?

It is when a hard Tumour or Swelling is perceiv'd near a Hole in the Place of the Joint, great Pain being felt in the Part, and the Motion of it abolish'd.

What are the signs of an imperfect, partial and incompleat Dislocation?

It is when the Motion is streighten'd, and weaker than ordinary, so that some Pain is felt in the Joynt, and a Deformity may be discern'd therein, by comparing the hurt Part with the opposite, which is sound: This Dislocation is otherwise called a Sprain, when it proceeds from an external Cause; or else it is termed a Relaxation, when it happens by an internal.

What is a simple, and what is a complicated Dislocation or Luxation?

The Dislocation is properly simple, when it hath no concomitant Accidents; and it is complicated when accompanied with some ill Symptoms or Accidents, such as Swellings, Inflammations, Wounds Fractures, &c.

What are the Means proper to be us'd in a simple Dislocation?

A speedy and simple reducing thereof, which is perform'd by extending the dislocated or luxated Member, and thrusting back the Head of the Bone into its natural Place. Afterward the Joint must be strengthened with a Fomentation made with Provence Roses, the Leaves of Wormwood, Rosemary, Camomile, St. John's-wort, and Oak-Moss boiled in the Lees of Wine and Forge-Water, keeping the Part well bound up, and sustain'd in a convenient situation. But if any ill Consequence is to be fear'd, apply *Emplastrum Oxyroceum*, or *Diapalma* dissolv'd in Wine.

What is to be done in a complicated Dislocation?

The Accidents must be first remov'd, and then the Bone may be set, which is impossible to be done otherwise ; it being dangerous even to make an Attempt before, by reason of the too great Violence with which it is effected, and which would infallibly produce a Convulsion or a Gangrene.

If the Dislocation be accompanied with a Wound, must the Wound be cured before any Endeavours are us'd to reduce it ?

No, but the Symptoms of the Wound, which hinder the Operation, must be taken away, as the Swelling, Inflammation, and others of the like Nature ; and then it may be reduc'd, and the Wound may be dress'd according to the usual Method.

If a Dislocation be complicated with a Fracture, what is to be done then ?

It is necessary to begin with reducing of the Dislocation, and afterward to perform that of the Fracture, by reason of the Extension which must be made to reduce the Dislocation, which would absolutely hinder the Setling of the Fracture.

How is the Inflammation and Swelling to be asswag'd ?

With Linnen Clothes dipt in Brandy and common Water, which must be often renewed ; or else with the Tops of Wormwood and Camomile, with Sage and Rosemary boiled in the Lees of Wine, wherein the Compresses and Bands are to be steep'd. But all Repellents and Astringents must be avoided.

How doth it appear that the Reduction is well perform'd ?

By

By the Re-establishment of the Part in its natural State ; by its being free from Pain ; by its regular Motion ; and by its conformity to the opposite Part which is sound.

What Dislocations of Parts are most difficult to be reduc'd ?

Those of the Thighs with the Hip Bones, which are almost never perfectly set ; that of the first *Vertebra* is extremely difficult to be reduc'd ; and those of the Lower Jaw and Soles of the Feet are mortal.

The reducing of Dislocations is perform'd with greater facility in Infants than in Persons advanc'd in Years ; but it becomes most difficult when it is deferr'd for many Days, by reason of the overflowing of the *Lympha* and nutritious Juice.

If an Inflammation should happen before the Member is reduc'd, nothing can be done till it be allay'd, as we have already intimated ; but to prevent and mitigate it, the dislocated Joynt, and the neighbouring Parts may be bath'd with luke-warm Wine, in which hath been boil'd the Tops of *St. John's Wort*, *Camomile*, *Rosemary*, *Stecas Arabica*, and other Ingredients of the like Nature ; the Bands must be also steep'd in the same Liquor.

If an *Oedematous* Tumour arise in the luxated Member after the Joint hath been set, it is requisite to take internal Sudorificks, and to apply Liniments made with the distill'd Oil of *Tartar*, and of *Humane Bones*, which may be rectify'd with burnt *Harts Horn*, or some other part of Animals, to take away its stink : Or else take *Yellow Wax*, and very white *Rosin*,
L 4 melt

melt the whole Mals, and put into it White Amber and Gum *Elemi*, a sufficient quantity of each to make a Composition to be incorporated with Balsam of *Peru*; a Plaister of which may be prepar'd, and apply'd to the dislocated Member; but the Plaister must not be laid a cross, lest it should contract the Part too much. The whole Member may also be anointed with Oil of St. *John's* Wort, or with the distill'd Oil of Turpentine; or rather with a simple Decoction of Nervous Plants in Wine.

If the Bone be put out of its place by a coagulated sort of Matter like Mortar or Plaister, Resolatives and Attenuants are to be us'd, such as the volatile Spirit of Tartar prepar'd with the Lees of Wine, volatile Spirit of Tartar distill'd with Nitre in a Retort with a long Neck, or Spirit of Tartar prepar'd by Fermentation with Tartar and its proper *Alkali*: This last is the best of all, and the use thereof ought to be continu'd. The volatile Salt of Humane Bones is also very efficacious; but it is necessary to begin first with the taking of Laxative and Sudorifick Medicines, appropriated according to the respective Circumstances. The Spirit of Earth-Worms may be also apply'd outwardly, which is made by Fermentation, and may be often laid on the Part either alone, or with the Spirit of *Sal Ammoniack*.

If a dislocated Bone be not set in good time, a *Coagulum* or kind of curled Substance is form'd in the Cavity, which hinders the reducing of it to its place; but this *Coagulum* may be dissolv'd with the following Medicament before you attempt to set the Bone. Take one
part

part of the distill'd Oil of Humane Bones, two parts of foetid Oil of Tartar; mingle the whole, and add quick Lime to be distill'd in a Retort: Let the Parts be fomented with this Oil.

If the Dislocation happen'd by the Relaxation of the Ligaments, recourse may be had to universal Sudorificks taken inwardly; as also to such Medicines as are full of an unctuous and volatile Salt, particularly Aromatick Oils, and Spirit of *Sal Ammoniack*. In the mean while Aromaticks, Resolutives, and moderate Astringents may be apply'd outwardly.

CHAP. II.

Of the Fractures of Bones.

What is the Fracture of a Bone?

It is the Division of the Continuity of its Parts.

After how many different manners may a Bone be broken?

Three several ways, viz. cross-wise, side-wise, in its length, and perhaps in Shatters or Splinters.

By what means may a Bone be fractur'd?

It may happen to be done by three sorts of Instruments, viz. such as are fit for bruising, cutting, or wrestling; that is to say, a Bone may be divided in the Continuity of its proper Parts, by Contusion, Incision, or Contorsion.

How is the Fracture of a Bone discover'd?

Divers ways, viz. by the ill Disposition of the Part, which becomes shorter; by its want of Motion; by its flexibility or plianthness elsewhere than in its Articulations; by the unevenness that may be perceiv'd in its Continuity; by the cracking which is heard; sometimes also by the shooting forth of one of its ends thro' the Flesh which it hath open'd; and lastly by a Comparison made thereof with the sound Part on the other side, as that of the Right Arm with the Left.

What kind of Fracture is most difficult to be discern'd?

It is that which happens in the length of the Bone, commonly call'd a Cleft or Fissure, which gives occasion to very great Symptoms when it is unknown: But it may be found out by the Pain and Swelling felt at the bottom of the Cleft in touching it; besides the Conjectures which may be made from the Relation of the Person who hath had a Fall, and might have heard the cracking of the Bone.

What sort of Fracture is most difficult to be cur'd?

The shattering or splitting of a Bone in pieces, by reason of the great number of Splinters which daily cause new Pains and Suppurations.

What is a simple, and what is a complicated Fracture?

The simple Fracture is that whereby the Bone is broken, without any other Accident; and the complicated Fracture is that which is follow'd by some Accident; as that in which there is a splitting of the Bone in pieces, or where

where the Bone is broken in two several places, or else when the Fracture is accompany'd with a Luxation, a Wound, an Inflammation, or other Circumstances of the like Nature.

Are old Men or Children most subject to these Fractures of the Bones?

Old Men, because their Bones are drier; whereas those of Infants are almost Cartilaginous, and yield or give way to the violence offer'd to 'em: from whence proceed the sinkings and hollowness that happens in their Skull, especially in the Mould of their Heads, or elsewhere; for which a Remedy is found out by the means of Plaisters, Splints, and Bandages, fitted to the shape of the Parts. It is also on the same Account that Bones are more easily broken in the Winter than in the Summer.

In what Parts are the Fractures of Bones most dangerous?

They are those that happen in the Skull and Joints; in the former by reason of the Brain; and in the latter in regard of the nervous Parts.

What Course is to be taken by a Surgeon who is sent for to cure a Fracture?

He ought to do three things, that is to say, at first he must incessantly endeavour to reduce it, to the end that Nature may re-unite the Parts with greater Facility, and that its Extremities may be brought together again with less trouble, before a Swelling, Inflammation, or Gangrene happen in the Part. Afterward he is to use means to retain the Parts in their proper Figure, and natural

ral Situation, and to prevent all sorts of Accidents.

How is the setting of a broken Bone to be perform'd?

When the Fracture is Cross-wise, it must be reduc'd by Extension and contra-Extension; and when it is in length, the Coaptation or bringing together again of the Sides, is only necessary.

What is to be done in a Fracture complicated with a Wound?

The Operator must first reduce it, and then administer the other Helps, as in a simple Fracture.

How may it be known that the reducing of the Fracture is well perform'd?

When the Pain ceaseth; when the Part hath resum'd its natural Shape; when no Unevenness is any longer perceiv'd therein; and when it is conformable to the sound Part on the other side.

What are the Signs which shew that the Splinters remain in the Fracture after it hath been reduc'd?

They are the secret and continual Workings of the Fibres, or Twitchings, that are felt by Intervals in the part, with great Pains, which are the Indications of an Abscess arising therein; and when a Wound is join'd to the Fracture, the Lips of it are puffed up, and become more soft and pale, the purulent Matter abounding also more than ordinary.

When Splinters appear, must they be drawn out by force?

By no means ; for great care ought to be taken to avoid all manner of violent Operations ; it being requisite to wait for their going out with the purulent Matter ; or at most to facilitate their Passage by the use of Injections of the Tincture of Myrrh and Aloes ; by the Application of *Emplastrum Andreae Crucii*, and by the help of the Forceps.

How is a simple Fracture to be dress'd, after it hath been reduc'd ?

The Parts are to be strengthen'd and consolidated with Liniments of *Oleum Lumbricorum*, or of Oil of St. John's Wort mingled with Wine, Brandy, or *Aqua-Vitæ* ; with Fomentations of Red Roses, Rosemary, and St. John's Wort boil'd in Wine ; and with *Emplastrum contra Rupturam*, or *de Betonica*, carefully wrapping up the broken Member, but after such a manner that the two Extremities may not cross one another ; and that a small Space may remain open between both. Afterward the Splints and Bands are to be apply'd, taking care to avoid binding 'em too hard, and to take 'em off every three Days, in order to refit 'em, to abate troublesome Itchings, and to give Air to the Part ; by these means preventing the Gangrene, which might happen by the Suffocation of the natural Heat. If the Thighs or Legs are broken, Scarves are to be us'd to support and stay 'em in the Bed.

What space of time may there be allow'd for curing the Fracture of a Bone ?

The Cure will take up more or less time, according to the variety of the Parts, or the different thickness of the Bones : Thus to form the

the *Callus* of the broken Jaw Bone, twenty Days may well be allotted; for that of the Clavicle, or that of the Shoulder Bone, twenty four; for that of the Bones of the Elbow, thirty; for that of the Arm Bone, forty; for that of the Wrist Bone, and those of the Fingers, twenty; for that of the Ribs, twenty; for that of the Thigh Bone, fifty; for that of the Leg Bone, forty; for that of the Bones of the *Tarsus* and Toes, twenty.

What ought to be done in particular to promote the Formation of the Callus?

The fractur'd Part must be rubb'd with *Oleum Lumbricorum* and Spirit of Wine heated and mingled together: The Decoction of Agrimony, Savine, and Saxifrage are also to be us'd, and the *Lapis Osteocolla* is a Specifick: It is usually given in great Comphrey Water, or in a Decoction of Perewinkle made with Wine, and is often reiterated.

C H A P. III.

Of the particular Fractures of the Skull.

WHAT is a Fracture of the Cranium or Skull?

It is a Wound of the Head complicated with a Fracture of the Skull Bone.

After how many manners may the Skull be fractur'd?

Three

Three several ways, viz. by Contusion, by Incision, and by Puncture.

What is the most dangerous of these Fractures?

That which happens by Contusion; because the Concussion and Commotion is greater.

Do all the Fractures of the Skull require the use of the Trepan?

No, the Fractures must be deep which stand in need of the help of such an Instrument; for those that are superficial may be cur'd by a simple Exfoliation.

What is that deep Fracture, wherein the use of the Trepan is absolutely necessary?

It is that, which is made in the two Tables of the Skull, penetrating to the Meninges of the Brain; upon which at that time the Blood is extravasated and must be removed by the Operation of the Trepan.

How may it be discover'd that the two Tables of the Skull are broken?

By Inspection or Reason.

Are not the Eyes sufficient alone, and are they not more certain than Reasonings?

Yes; but forasmuch as things are not always seen, there is often a necessity of making use of rational Deductions to find out that which the Eyes cannot discern.

When doth it happen that the Eyes alone discover the Fracture?

When the Wound is large and wide, so that it may be immediately view'd.

When doth it happen that Reason supplies the defect of the Eyes?

When the Wound is so small that the Bone cannot be seen, and nothing appears but the Accidents.

What

What are the Accidents or Signs of the Fracture of the Skull?

They are a dimness of the Sight, and loss of the Understanding, which happen at the very Moment when the Fall or Blow is receiv'd; with the Vomiting of Choler that follows soon after: These Signs are call'd *Univocal*. And there are others call'd *Equivocal*, and which confirm the former; as a Flux of Blood thro' the Nose, Eyes, and Ears, redness of the Eyes, heaviness of the Head, and puffing up of the Face; as also afterward Drowsiness, Shivering of the whole Body, Fever, *Deliriums*, Convulsions, &c.

Must all these Signs appear before a Determination can be made of the necessity of using the Trepan?

No, it is sufficient to have the *Univocal* Signs to make a Crucial Incision in the place of the Wound, and to lay bare the Bone, in order to observe the Fracture, which sometimes is so fine, that the Operator is oblig'd to make use of Ink, which insinuates it self into the Cleft, and of a particular Instrument, with which the black Line that hath penetrated to the bottom, cannot be rubb'd out; whereas it may be easily defac'd when the Fracture is only superficial.

How long time is commonly spent before the appearing of the Accidents?

In the Summer Season they appear in three or four Days, and at the latest in seven; in Winter they are slower, and sometimes do not happen till the fourteenth Day: But at the end of this term, it may be affirm'd that the Trepan is often unprofitable.

What

What is requisite to be done in a doubtful Occasion? must the Trepan be apply'd or omitted?

The Surgeon is to have recourse to his own Conscience and Discretion, which ought to serve as a Guide, and requires that we should always act according to the known Rules of Art; inso-much that after having well consider'd the Accidents, with all the Circumstances of the Wound, if there be no good Grounds for the undertaking of the Operation, it is expedient to desist, and in this case to have deference to the Advice of other able Surgeons of the same Society, rather than to rely too much upon his own Judgment, to the end that he may be always secure from all manner of Blame.

Is the Trepan apply'd upon the Fracture?

No; but on one side of it, and always in a firm place.

What Course is to be taken when a Fracture is found in a Suture?

A double Trepan is to be made and apply'd on each side of the Suture, by reason of the effusion of the Blood, which may hapen therein.

What Method ought to be observ'd in the curing of the Wounds of the Head, and Fractures of the Skull?

In simple Wounds of the Head it is necessary only to make use of Balsams, and to lay over 'em *Emplastrum de Betonica*. When there is a Contusion either in the *Pericranium*, or in the Skull, the Wound must be kept open till after the Suppuration or Exfoliation.

When there is only a Bunch without any Wound or Accident, it must speedily be dissolv'd with Plaister or Mortar, Chimney-Soot, Oil

Oil of Olives, and Wine: laid upon the Part between two Linnen Rags; or else with Soot, Spirit of Wine, and Oil of St. *John's Wort*, where in the Bolsters are soakt, to be in like manner app'y'd with a Band.

Wounds of the Head accompanied with a Fracture, absolutely require the application of the Trepan, wherein it is requisite to make use of Oil of Turpentine to the Membranes of the Brain; or else Spirit of Wine mingled with Oil of Almonds, and not with the Oil or Syrrup of Roses; and to endeavour to cause a plentiful outward Suppuration.

Besides, it must not be neglected to enjoyn the wounded Person to be let Blood both before and after the Operation, if he hath a Fever or a Plethory; and more especially it is to be remember'd to cause his Body to be kept open at least every other Day, with Clysters, obliging him to keep a good Diet, and to avoid all violent Agitations both of Body and Mind, abstaining from eating Flesh till the fourteenth Day. All manner of Venery and Conjugal Embraces, which prove fatal at this time, are to be prohibited during forty Day, to be counted from the Day of the Operation; as they are also in all other considerable Wounds.

C H A P. IV.

*Of the Caries or Ulcer of the Bones,
Exostosis, and Nodus.*

WHAT is Caries?

It is the Putrification of the Substance of the Bone, or else its Ulcer or Gangrene.

Whence doth the Caries of the Bone derive its Original?

It proceeds from an internal and external Cause; the former being that which hath been produc'd at first in the Substance of the Bone; and the other that which takes its Rise from an inveterate Ulcer in the Flesh, which hath communicated its Malignity to the Substance of the Bone, and by that means corrupted it.

How is the Caries known which proceeds from an inward Cause?

By the continual and violent Pains which are felt before, and continue for a long time without diminution; as also afterward by the alteration of the Flesh that covers the Bone, and which becomes soft, spongy and livid.

By what means is a Caries that derives its Origine from an outward Cause, discover'd?

By the quality of the purulent Matter that issueth out of the Ulcer in the Flesh, which is blackish, Unctuous, and extremely stinking; as also by the help of the Probe, that discovereth

at

an Asperity or Roughness in the Bone when it is laid bare.

What Means are to be us'd in order to cure a Caries proceeding from an external Cause?

The Powder of Flower-de-luce may be us'd, and it is sufficient for that purpose, when the Caries is superficial; but it is necessary to take *Oleum Guyaci*, and to soak Pledgits therein, to be laid upon the Ulcer when it is deep; or else *Aqua vite* or Brandy, in which have been infused the Roots of Flower-de-luce, Cinnamon and Cloves. Lastly, the actual Cautery, which is Fire, must be apply'd thereto.

What is to be done when the Caries proceeds from an internal Cause?

The Flesh must be opened to give passage to the Sanies that runs out of the Ulcerated Bone, to the end that Exfoliation may be procured; and if the Ulcer hath not as yet laid open the Bone on the outside, the Trepan ought to be applied; but the Ulcer or Caries must be afterward handled, as we have even now declar'd.

What is Exostosis?

It is the Swelling of a Bone made by the settling of a corrupt Humour in its proper Substance.

What is a Nodus?

It is a kind of gummy and wavering Tumour, which is form'd by the settling of a gross Humour between the Bone and the *Periosteum*.

Are Exostoses and Nodus's suppurable Tumours?

Yes, because they sometimes produce Ulcers and Gangrenes in the Bone, which are called Caries,

Caries, proceeding from an internal Cause; nevertheless they are generally dissolv'd by Frictions with *Unguentum Griseum*, or by the application of Plaisters of Tobacco, or *Emplastrum de Vigo quadruplicato Mercurio*; taking also to the same purpose internal Diaphoretick and Sudorifick Medicines, with convenient Purgatives.

CHAP. V.

Of Cauteries, Vesicatories, Setons, Cupping-Glasses, and Leeches.

WHAT is a Vesicatory?

The Name of Vesicatory may be attributed to every thing that is capable of raising Blisters or Blisters in the Skin; nevertheless in Surgery, by a Vesicatory is understood a Medicament prepared with *Cantharides* or *Spanish Flies* dried, which are beaten to Powder, and mingled with Turpentine, Plaisters, Leaven, and other Ingredients.

In what Places, and after what manner are Vesicatories usually applied?

They are applied every where accordingly as there is occasion to draw out or discharge some Humour from a Part: In Defluxions of Rheum upon the Eyes or Teeth, they are laid on the Neck and Temples; in Apoplexies, behind the Ears; and so of the rest, observing always to make Frictions on the Places where the Application

plication is to be made, to the end that the Vesicatory may sooner take effect.

How long time must the Vesicatory continue on the Part?

The Blisters are generally raised by 'em within the space of five or six Hours; yet this Operation depends more or less upon the Fineness of the Skin; and when the Bladders or Blisters appear, it is requisite to defer the opening of 'em for some time, to the end that Nature may have an Opportunity to introduce a new Scarf-Skin, by which means the Pain may be avoided that would be felt, if the Skin were too much expos'd to the Air.

What is a Cautery?

It is a Composition made of many Ingredients, which corrode, burn, and make a Escar on the Part to which they are applied.

How many sorts of Cauteries are there in general?

There are two kinds, viz. the Actual and the Potential; the former are those that have an immediate Operation; as Fire, or a red-hot Iron; and the others are those that produce the same Effect, but in a longer space of time; such are the ordinary Cauteries compos'd of Caustick Medicaments.

Which are the most safe, the Actual or the Potential Cauteries?

A distinction is to be made herein; for Actual Cauteries are safest in the Operation, because they may be applied wheresoever one shall think fit, as also for as long a time, or for any Purpose: Whereas the Potential cannot be guided after the same manner. But in Hæmorrhages,

thages, the Potential Cauteries are most eligible, by reason that the Escar produc'd by 'em not being so speedily form'd, the Vessels are better clos'd and they are not so subject to open again when it falls off; as it often happens in the Fall of an Escar made by Fire.

In what Places are Cauteries usually applied?

In all Places where an Attraction is to be made, or an Intemperature to be corrected, or a Flux of Humours to be stop't, by inducing an Escar on the Part: However, they are commonly laid upon the Nape of the Neck, between the first and second Vertebra; on the outward Part of the Arm in a small Hole between the Muscle *Deltoides* and the *Biceps*; above the Thigh, between the Muscle *Sartorius*, and the *Vastus Internus*; and on the inside of the Knee, below the Flexors of the Leg; observing every where that the Cautery be plac'd near the great Vessels, to the end that it may draw out and cleanse more abundantly.

What is the Composition of the Potential Cauteries?

They may be made with quick Lime, Soap, and Chimney-Soot; or else take an Ounce of *Sal Ammoniack*, two Ounces of burnt *Roman Vitriol*, three Ounces of quick Lime, and as many of *Calcin'd Tarrar*; mingle the whole Mals together in a *Lxivium* of Bean-Cod Ashes, and cause it to evaporate gently to a Consistence: Let this PASTE be kept for use in a dry Place, and in a well stop't Vessel. Or else the Silver Cautery or *Lapis infernalis*, may be prepar'd after the following manner:

Take

Take what Quantity you please of Silver; let it be dissolv'd with thrice as much Spirit of Nitre in a Vial, and set the Vial upon the Sand-Fire, to the end that two third Parts of its Moisture may evaporate: Then pour the rest scalding-hot into a good Crucible, placed over a gentle Fire, and the Ebullition being made, the Heat of the Fire must be augmented, till the Matter sink to the Bottom, which will become as it were an Oil: Afterward pour it into a somewhat thick and hot Mould, and it will coagulate, so as to be fit for Use, if it be kept in a well-stopt Vial. This Cautery is the best; and an Ounce of Silver will yield one Ounce and five Drams of *Lapis infernalis*.

What is a Seton?

It is a String of Silk, Thread or Cotton, threaded through a kind of Pack-Needle, with which the Skin of a Part is to be pierc'd thro', to make an Ulcer therein, that hath almost the same Effect as a Cautery.

What is most remarkable in the Application of a Seton?

It ought to be observed, that the String must be dipt in Oil of Roses, and that one End of it must always be kept longer than the other, to facilitate the running of the Humours.

In what Parts is the Seton to be apply'd?

The Nape of the Neck is the usual Place of its Application, although it may be made in any part of the Body where it is necessary. Sometimes happens that a Surgeon is obliged to use a kind of Seton in such Wounds made with a Sword, or by Gun-shot, as pass quite thro'

thro' from one side to the other; then the String or Skain must be dipt in convenient Ointments or Medicinal Compositions; and as often as the Dressings are taken away, it will be requisite to cut off the Part soak'd in the purulent Matter, which must be taken out of the Ulcer.

What is a Cupping-glass?

It is a Vessel or kind of Vial, made with Glass, the Bottom whereof is somewhat broader than the Top, which is applied to the Skin to cause an Attraction. There are two sorts of these Cupping-Glasses, viz. the Dry and the Wet; the former are those that are laid upon the Skin without opening it; and the latter those that are applied with scarification.

In what Diseases are Cupping-Glasses us'd?

In all kinds where it is necessary to make any Attraction; but more especially in Apoplexies, Vapours in Women, Palsies, and other Distempers of the like Nature. But the Applications of Cupping-Glasses are altogether different; for in Apoplexies, they are generally set upon the Shoulders or upon the *Coccyx*; in Vapours upon the Inside of the Thighs; and in Palsies, upon the Paralytick part it self.

What is a Leech?

It is an Animal like a little Worm which sucks the Blood, and is commonly apply'd to Children and weak Persons, to serve instead of Phlebotomy: Leeches are also used for the discharging of a Defluxion of Humours in any Part; as also in the Hemorrhoidal Veins when they are too full; in the *Varices*, and in several Parts of the Face.

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What choice ought to be made of Leeches?

It is requisite to take those that have their Backs greenish, and their Bellies red; as also to seek for 'em in a clear running Stream, and to cast away those that are black and hairy.

CH A P. VI.

Of Phlebotomy.

W H A T is Phlebotomy?

It is an Evacuation of Blood procur'd by the artificial Incision of a Vein or Artery, with a design to restore Health.

Which are the Vessels that are open'd in Phlebotomy or Blood-letting?

They are in general all the Veins and Arteries of the Body, nevertheless some of them are more especially appropriated to this Operation; as the *Vena Preparatora* in the Forehead; the *Ranula* under the Tongue; the Jugular Veins and Arteries in the Neck; the Temporal Arteries in the Temples; the *Cephalick*, *Median* and *Basilick* Veins in the inside of the Elbow; the *Salvatella* between the Ring Finger and the Little Finger; the *Poplitea* in the Ham; the *Saphena* in the internal Malleolus or Ankle, and the *Ischiatica* in the external.

What are the Conditions requisite in the due performing of the Operation of Phlebotomy?

They are these, viz. to make choice of a proper Vessel; not to open any at all Adventures; not to let Blood without necessity, not

without the Advice of a Physician; whole Office it is to determine the Seasons or Times convenient for that purpose; as that of Intermission in an intermitting Fever; that of Cooling in the Summer; and that of Noon-tide in the Winter; and lastly, to take away different Quantities of Blood; for in the Heat of Summer they ought to be lesser, and greater in the Winter.

What are the Accidents of Phlebotomy?

They are an Impostumè, a *Thrombus*, an *Echymosis*, an *Aneurism*, Lipothymy, Swooning, and a Convulsion.

What is a Thrombus?

It is a small Tumour of the Blood which happens in the Place where the Operation is perform'd either by making the Orifice too small, or larger than the Capaciousness of the Vessel will admit. The *Thrombus* is cured by laying upon it a Compress dipp'd in fair Water, between the Folds of which must be put a little Salt, to dissolve and prevent the Suppuration.

How may it be perceiv'd that an Artery hath been prick'd or open'd in letting blood?

The Puncture of an Artery produceth an Aneurism; and the opening of it causeth a Flux of a bright Scarlet-colour'd Blood, which issueth forth in abundance, and by Leaps.

Are the Leaps which the Blood makes in running, a certain Sign that it comes from an Artery?

No, because it may so happen, that the Basilick Vein lies directly upon an Artery, the beating of which may cause the Blood of the

Basilica to run out leaping: Therefore these Three Circumstances ought to be consider'd jointly; that is to say, the Vermilion Colour, the great Quantiry and the Leaps, in order to be assured that the Blood proceeds from an Artery.

How may it be discover'd that a Tendon hath been hurt in letting Blood?

It is known when in opening the *Median Vein* the End of the Lancer hath met with some Resistance; when the Patient hath felt great Pain, and afterward when the Tendon apparently begins to be puff'd up, and the Arm to swell. A Remedy may be apply'd to this Accident thus; after having finished the Operation, a Bolster steep'd in *Oxycratum* is to be laid upon the Vessel, a proper Bandage is to be made, and the Arm must be wrapt up in a Scarf: If the Inflammation that ariseth in the Part, be follow'd with Suppuration, it must be dress'd with a small Tent; and if the Suppuration be considerable, it is necessary to dilate the Wound, and to make use of Oil of Eggs and Brandy, or *Arcæus's* Liniment, with a good Digestive; as also to apply *Emplastrum Ceratum*; to make an Embrocation on the Arm with Oil of Roses; and to direct the Bolsters in *Oxycratum* to cover the whole Part.

Is it not to be fear'd that some Nerve may be wounded in letting blood?

No, they lie so deep that they cannot be touch'd.

Under what Vein is the Artery of the Arm?

It is usually situated under the *Basilica*.

What Course is proper to be taken to avoid the Puncture of an Artery in letting Blood?

It must be felt with the Hand before the Ligature is made, observing well whether it be deep or superficial; for when it lies deep, there is nothing to be fear'd; and when it is superficial it may be easily avoided by pricking the Vein either higher or lower.

What is to be done when an Artery is opened?

If it be well open'd, it is requisite to let the Blood run out till the Person falls into a Syncope or Swoon, by which means the Aneurism is prevented; and afterward the Blood will be more easily stopp'd: It remains only to make a good Bandage with many Bolsters, in the first of which is simply put a Counter or a Piece of Money; but a bit of Paper chew'd will serve much better, with Bolsters laid upon it in several Folds.

If the Arteries cause so much trouble when open'd accidentally, why are those of the Temples sometimes open'd on purpose, to assuage violent Pains in the Head?

By reason that in this place the Arteries are situated upon the Bones that press them behind; which very much facilitates their Re-union.

Are not the Arteries of Persons advanc'd in Years more difficult to be closed, than those of Children?

Yes.

Are not Accidents to be fear'd in letting blood in the Foot?

Much less than in the Arm; because the Veins of the *Malleoli* or Ankles are not accompanied either with Arteries or Tendons; which gave Occasion to the Saying, *Let the Apprentice bleed you in the Foot, but the Master in the Arm.*

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A
TREATISE
OF

Chirurgical Operations.

CHAP. I.

Of the Operation of the Trepan.

THIS Operation is to be performed, when it is inferr'd from the Signs, of which we have already given a particular Account, that there is an Effusion of Matter on the *Dura Mater*. The Trepan must not be us'd in the *Sinus Superciliares*, by reason of their Cavity; nor in the Sutures, in regard of the Vessels that pass thro' em; nor in the Temporal Bone without great necessity, especially in that part of it which is join'd to the Parietal Bone, lest the End of this Bone should fly out of its Place, since it is only laid upon the Parietal; nor in the middle of the Coronal and Occipital Bones, by reason of an inner

Prominence wherein they adhere to the *Dura Mater*; nor in the Passage of the Lateral Sinus's that are situated on the side of the Occipital.

If the Fissure be very small, the Trepan may be apply'd upon it, altho' it is more expedient to use this Instrument on the side of the Fissure in the lower part; neither is the Trepan to be set upon any Depressions; and if the Bones are loosen'd or separated, there needs no other trepanning than to take 'em away with the Elevatory.

The Operation must be begun with Incision, which is usually made in form of a Cross, if the Wound be remote from the Sutures, and there are no Muscles to be cut, and in the shape of the Letter T, or of the Figure 7, if it be near the Sutures, so that the Foot of the 7, or of the T, ought to be parallel to the Suture, the top of the Letter descending toward the Temples; it is also made in the middle of the Forehead. If it be sufficient to make a longitudinal Incision in the Forehead, its Wrinkles may be follow'd, and there will be less Deformity in the Scar; but it is never done Crosswise in this Part, and the Lips of the Wound are not to be cut. If an Incision be made on the Temporal Muscle, and on those of the back-part of the Head, it may be done in form of the Letter V. the Point of which must stand at the bottom of the Muscles; nevertheless it is more convenient to make a longitudinal Incision by which means fewer Fibres will be cut; and it is always requisite to begin at the lower part, to avoid being hindred by the Hamorrhage.

The

The Incisions are to be made with the Incision-Knife, and that boldly when there are no Depressions; but if there be any, too much weight must not be laid on 'em. Thus the Incision being finish'd, the Lips of the Wound must be separated from the Skull, either with the Fingers, or some convenient Instrument: Then if there be no urgent occasion to apply the Trepan, it may be deferr'd till the next Day, the Wound being dress'd in the mean time with Plaisters, Compresses, Pledgets, and a large Kerchief or Cap, the use of which we shall shew hereafter.

The Operation is begun with the Perforative, to make a little Hole for the fixing of the Pyramid or Pin which is in the Crown; afterward the Crown is to be apply'd, holding the Handle of the Trepan with the Left Hand, and turning with the other very fast in the beginning; but when the Crown hath made its way, it is lifted up to remove the Pin, lest its Point should hurt the *Dura Mater*: Thus the Crown being taken off from time to time, to be cleans'd from the Filings it is set on again, and the Operator begins his Work of turning anew, which must be carry'd on gently when any Blood appears, that the piece of Bone of the first Table may not be broken off from the second. When he comes near the *Dura Mater*, the Operator must proceed, in like manner, gently, searching with a Quill, cut into a Knib, like a Pen for Writing, round about the Bone, to observe whether he still be in the Skull. He must also often lift up the Trepan to search the Hole, to cleanse the Instrument, and to keep it from growing

hot. As often as the Trepan is taken off, let him search with a Feather, to see whether the Bone be cut equally; and if it be not, he must lean more on that side which is least cut. If it be necessary to make use of the *Terebellum*, the Hole must be made in the beginning, whilst the Bone is as yet firm: and when the Piece begins to move, the *Terebellum* is to be put very gently into its Hole, without pressing the Bone to draw it out; or else it may be taken away with the Myrtle-Leaf. When the Piece is thus remov'd, the uneven Parts that remain at the bottom of the Hole, are to be cut with the *Scalper Lenticularis* or Lenticular Instrument; and if there be any Depressions, they may be rais'd with the Elevatory. Whereupon the *Dura Mater* may be compress'd a little with the *Scalper Lenticularis*, to facilitate the running out of the Blood, the wounded Person being oblig'd to stoop with his Head downward, stopping his Nose and Mouth, and holding his Breath for a while whilst it is evacuated. Then the *Dura Mater* may be wip'd with Lint; but if any Pus or corrupt Matter lies underneath, it must be pierc'd with a Lancet wrapt up in a Tent, that it may not be perceiv'd by the Assistants. Afterward a *Sindon* or very fine Linnen Rag dipt in a proper Medicament, is put between the *Dura Mater* and the Skull; the Hole is fill'd with small Pledgits steep'd in Medicinal Liquors; and the Wound is dress'd with Pledgits, a Plaister, and a Kerchief.

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But the Hole ought to be well stop't with Pledgits, because the *Dura Mater* is sometimes so much inflam'd that it bursts forth. If any Excrefcences arise therein, and go out of the Hole, having small Roots, they may be bound and cut; but if their Roots be large, they must be press'd close with small Pledgits steep'd in Spirituous Medicines. Here observe, that the Operation of the Trepan ought to be perform'd more gently in Children than in adult Persons, in regard that their Bones are more tender; and that Oily Medicines must not be us'd, but Spirituous. The Exfoliation is made sometimes sooner, and sometimes later; but the *Callus* usually covers the opening of the Skull within the space of forty or fifty Days, if no ill Accident happens. In great Fractures, where there is no longer any connexion between the Bones, it is requisite to take 'em away.

Of the Bandage of the Trepan.

The proper Bandage to be us'd after the Operation of the Trepan, is the great Kerchief or Cap, which is a large Napkin folded into two parts after such a manner that the side which toucheth the Head exceeds that which doth not touch it in the breadth of four Fingers; it is apply'd to the Head in the middle, whilst a Servant holds on the Dressing with his Hand: Then the two upper ends of the Napkin being brought under the Chin, the Surgeon takes the two lower, and draws 'em streight by the sides, so as that side of the Napkin, which is four Fingers broader

broader than the other, may be laid upon the Forehead : Afterward the two ends of the Napkin are cross'd behind the Head, and fasten'd at their Extremities with Pins, without making any Folds that might hurt the Part ; but the ends of the Napkin which fall upon the Shoulders, are rais'd up to the Head near the lesser Corner of the Eyes ; and the two ends under the Chin are fasten'd with Pins, or else tied in a Knor.

C H A P. II.

Of the Operation of the Fistula Lachrymalis.

THIS Operation is perform'd when there is a Fistulous Ulcer in the great Corner of the Eye, after this manner : The Patient being plac'd in a convenient Posture, and having his sound Eye bound up, to take away the sight of the Instruments ; the Operator causeth the other Eye to be kept steady by a Compress kept on by a Spoon, and makes an Incision with a Lancer, in form of a Crescent, upon the Tumour, taking care to avoid cutting the Eye-Lid and the little Carrilage which serves as a Pulley to the great Oblique Muscle. If the Bone be carious, an Actual Cautery may be apply'd thereto, using for that purpose a small Funnel or Tube, through the Canal of which the Cautery is convey'd to the Bone. But the Bone must not be

be pierc'd, for it is exfoliated entire by reason of its smallness; and so the Hole is made without any Perforation.

*The Dressing and Bandage of the Fistula
Lachrymalis.*

The Wound is fill'd with small dry Pledgits, and cover'd with a Plaister and Compress: The Bandage is made with an Hankerchief folded triangular-wise; the ends of which are fasten'd behind the Head. If the Flesh grows too fast, it may be consum'd with the Lunar Caustick; and if there be occasion to dilate the Wound, to facilitate the Exfoliation, it may be done with little pieces of Sponge prepar'd, and put into it. Afterward Causticks are to be us'd to eat away the Callous Parts, which may be mingled with Oily Medicines, to weaken their Action, taking care, nevertheless, that the Eye receive no damage by them. If the Bone be corrupted, a little *Euphorbium* may be apply'd; or else small Pledgits steep'd in the Tincture of Myrrh and Aloes; and the Ulcer may be treated as all others.

C H A P. III.

Of the Operation of the Cataract.

THIS Operation is perform'd when there is a small Body before the Pupil of the Eye, which hinders the Sight from entring into it; but it is undertaken only in Blew, Green, and Pearl-coloured Cataracts, or in those that are of the Colour of polish'd Steel; and not in Yellow, Black, or Lead-colour'd. To know whether the Cataract be fit to be couch'd, the Patient's Eye must be rubb'd; so that if the Cataract remains unmoveable, it is mature enough; but if it changeth its place, it is requisite to wait till it become more solid. The Spring and Autumn are the most proper Seasons for performing the Operation.

To this purpose the Patient being set down with his Eyes turn'd toward the Light, and having his sound Eye bound up, the Surgeon must likewise sit on a higher Seat, whilst the Patient's Head is held by a Servant; and his Eye being turn'd toward his Nose, is kept steady with a *Speculum Oculi*, which is a little Steel Instrument made like a Spoon, pierc'd in the middle, so that the Ball of the Eye may be let through the Hole: Then the Surgeon taking a Steel Needle, either round or flat, accordingly as he shall judge convenient, perforates the Conjunctive at the end of the Corneous Tunicle, on the side of the little Corner of the Eye,

Eye, and boldly thrusts his Needle into the middle of the Cataract, which he at first pusheth upward, to loosen it with the Point of the Needle; and then downward, keeping it for some time with his Needle under the Pupil of the Eye. If it ascend again after it is let go, it must be depress'd a second time; but the Operation is finish'd when it remains in the same place where to it was thrust: Neither is the Needle to be remov'd till this be done, and the Cataract entirely couch'd. In taking out the Needle, the Eye-Lid must be pull'd down, and press'd a little over the Eye.

The Dressing and Bandage,

Is to cause both the Patient's Eyes to be clos'd and bound up; then he must be oblig'd to keep his Bed during seven or eight Days, and some Defensative is to be laid upon the sore Eye, to hinder the Inflammation.

M Dupré a Surgeon of the *Hotel-Dieu*, a Person very eminent in these kinds of Operations, hath observ'd, that as some Cataracts were form'd in a very little space of time in perfect Maturity; it happen'd also very often, that the Cataracts which were suppos'd to have got up again, were not the very same with those that were couch'd, but rather a new *Pellicula* or little Skin, which sometimes hath its Origine in the top of the *Uveous* Tunicle, and is caus'd only by a very considerable Relaxation of the Excretory Vessels from the Sources of the Aqueous Humour, which in filtrating permits the running off

off of many heterogeneous Parts, the Encrease of which produceth a new Cataract.

Of other Operations in the Eyes.

Sometimes a sort of purulent Matter is gather'd together under the Corneous Tunicle; to let this out, the Eye must be fixt in a Posture with the *Speculum Oculi*, and after a small Incision made therein with a fine Lancet, it must be prest a little to discharge the Matter; but if it be too thick, it may be drawn forth by sucking gently with a small Tube or Pipe, having a little Vial in the middle, into which the Matter will fall as it is suck'd out.

Sometimes a small Tumour ariseth in the Eye, which being ty'd at its Root with a Slip-Knot, to streighten it from time to time, will at length fall off: But if the Tumour lie in the Hole of the Pupil, this Operation must not be admitted, lest the Scar should hinder the Passage of the Light. Sometimes also a somewhat hard Membrane, call'd *Unguis*, appears in the great Corner of the Eye, which, when it sticks thereto, may be cut off by binding it; this is done with a Needle and Thread, which is pass'd thro' the Membrane, and afterward ty'd.

If the Eye-Lids are glu'd together, a crooked Needle without a Point may be threaded, and pass'd underneath them; then the Ends of the Thread may be drawn, to lift up the Eye-Lids, and they may be separated with a Lancet.

If the Hairs of the Eye-Lids or Eye-Brows offend the Eye, they must be pull'd out with a
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Pair of Tweezers or Nippers; and when any small, hard, and transparent Tumours arise in the Eye-Lids, they are to be open'd; to let out the corrupt Matter.

C H A P. IV.

Of the Operation of the Polypus.

THIS Operation is necessary, when there are any Excreescences of Flesh in the Nostrils, which, nevertheless, when they are livid, stinking, hard, painful, and adhere closely must not be tamper'd with, because they are Cancers. But if they are whitish, red, pendulous, and free from Pain, the Cure may be undertaken after this manner: Take hold of the *Polypus* with a Pair of *Forceps*, as near its Root as is possible, and turn it first on one side, and then on another, till it be pull'd off. If the *Polypus* descends into the Throat it may be drawn thro' the Mouth with a crooked *Forceps*; and if an Hæmorrhage should happen after the Operation, it may be stop'd by thrusting up into the Nostrils certain Tents soak'd in some styprick Liquor; or else by syringing with the same Liquor.

C H A P. V.

Of the Operation of the Hare-Lip.

THIS Operation is perform'd when the upper Lip is cleft; but if there be a great Loss of Substance, it must not be undertaken; neither ought it to be practis'd upon old nor scorbutick Persons, nor upon young Children, by reason that their continual Crying would hinder the Re-union. But if any are desirous that it should be done to these last, they are to be kept from taking any Rest for a long time, to the end that they may fall asleep after the Operation, which is thus effected :

If the Lip sticks to the Gums, it is to be separated with an Incision-Knife, without hurting 'em; then the Hare-Lip must be cut a little about the Edges with Scissors, that it may more easily reunite, the Edges being held for that Purpose with a Pair of Pincers, whilst the Servant who supports the Patient's Head, presseth his Cheeks forwards to bring together the sides of the Hare-Lip. Then let the Operator pass a Needle with wax'd Thread into the two Lips of the Wound, from the outside to the inside, a Hairs breadth from their Edges. Here Care must be had that the two Sides of the Hare-Lip be well adjusted, and very even. Lastly, let him twist the Thread round the Needle by crossing it above.

The Dressing and Bandage.

After the Lips are wash'd with warm Wine, the Points of the Needles must be cut off, small Bolsters being laid under their Ends; then the Wound is to be drest with a little Pledgit arm'd with some proper Balsam, putting at the same time under the Gum a Linnen Rag steep'd in some desiccative Liquor, lest the Lip shou'd stick to the Gum, if it be necessary to keep 'em apart. Lastly, upon the Hole is to be laid an agglutinative Plaister, which must be kept on with the uniting Bandage. This is a small Fillet perforated in the middle. Put this behind the Head, bring one End forward, pass it thro' the Hole in the middle, lay this part on the Wound, then bring the two Tails behind the Head, and passing them over the first Turns, fasten them there with a sufficient Number of Pins.

The Patient must be drest three Days after; and it is requisite at the first time only to untwist half the Needle, loosening the middle Thread if there be three; to which purpose a Servant is to thrust the Cheeks somewhat forward. On the eighth Day the middle Needle may be taken off, if it be a young Infant; Nevertheless the Needles must not be remov'd till it appears that the Sides are well join'd; neither must they be left too long, because the Holes wou'd scarce be brought to close.

C H A P. VI.

Of the Operation of Bröunchotomy.

THIS Operation becomes necessary, when the Inflammation that happens in the *Larynx* hinders Respiration, and is perform'd after this manner :

The Wind-pipe is open'd between the third and fourth Ring, above the *Cricoides* Cartilage, or else in the middle of the Wind-Pipe; but in separating the Muscles call'd *Sternohyodes*, care must be had to avoid cutting the recurrent Nerves, lest the Voice shou'd be lost; as also the Glands, nam'd *Thyroides*. The space between the Rings is to be open'd with a slender Lancet, bound round with a little Tape, and a transverse Incision made between 'em : Before the Lancet is taken out, put a Probe into the Orifice, on which pass a little Pipe, short, flat, and somewhat crooked at the End, which must not be thrust in too far, for fear of exciting a Cough. This Pipe hath two small Rings for the fastening of Ribbons, which are ty'd round about the Neck; and must be left in the Wound till the Symptoms cease. After that it must be taken away, and the Wound dress'd, the Lips of it being brought together with the uniting Bandage, which hath been already describ'd.

C H A P. VII.

Of the Operation of the Uvula.

WHEN the *Uvula* is swell'd so as to hinder Respiration or Swallowing, or else is Gangren'd, it may be extirpated thus: The Tongue being first depress'd with an Instrument call'd *Speculum Oris*, this must be held with a *Forceps*, and cut off with a Pair of Scissors; or else a Ligature may be made before it is cut; and the Mouth may be afterward gargl'd with Astringent Liquors.

C H A P. VIII.

Of the Operation of a Cancer in the Breast.

THE Cancer at first is not so big as a Pea, being a small, hard, ill-colour'd Swelling, sometimes livid, and very troublesome by reason of its Prickings; but when it is encreas'd, the Tumour appears hard, Lead-colour'd, and livid, causing in the Beginning a Pain that may be pretty well endur'd; but in the Increase it grows intolerable, and the Smell is extremely noisome. When it is ready to ulcerate, the Heat is vehement, with a pricking Pulsation, and the Veins round about are Turgid, being
fil-

fill'd with black Blood, and extended as it were the Feet of a Crab or Crey-Fish, till Death happen. When this Tumour is not ulcerated, it is call'd an *Occult Cancer*; and an *Apparent* one, when it breaks forth into an open Ulcer.

To palliate an Occult Cancer, and prevent its Ulceration; a Cataplasma or Pulvis of Hemlock very fresh may be apply'd to the Part. All the kinds of Succory, the Decoction of *Solanum* or Night-shade; the Juices of these Plants, as also those of Scabious, *Geranium*, or Stork-Bill, *Herniaria* or Rupture-wort, Plantain, &c. are very good in the beginning. River-Crabs pounded in a Leaden Mortar, and their Juice beaten in a like Mortar, are an excellent Remedy; as also are Humane Excrements, or Urine distill'd, and laid upon the Part: Or else,

Take an Ounce of Calcin'd Lead, two Ounces of Oil of Roses, and six Drams of Saffron; let the whole Composition be beaten in a Mortar with a Leaden Pestle and apply'd. The *Amalgama* of Mercury with Saturn is likewise a very efficacious Remedy.

In the mean while the Patient may be purg'd with *Black Hellebore* and *Mercurius Dulcis*, taking also inwardly, from One Scruple to Half a Dram of the Powder of Earth-Worms, given to drink, with half the Quantity of Crab's-Eyes: But very great Care must be taken to avoid the Application of Maturatives or Emollients, which wou'd certainly bring the Tumour to Ulceration.

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When the Cancer is already ulcerated, the Spirit of Soot may be us'd with good Success; and the Oil of Sea-Crabs pour'd scalding hot into the Ulcer, is an excellent Remedy. But if it be judg'd expedient entirely to extirpate the Cancer, it may be done thus:

The Patient being laid in Bed, let the Surgeon take the Arm on the Side of the Cancer, and raising it, and bringing it back to give Scope to the Swelling; then having pass'd a Needle with a very strong Thread through the Bottom of the Breast, let him cut the Thread, take away the Needle, and passing the Needle again into the Breast, cause the Threads to cross one another. Next, these four Ends of the Threads must be ty'd together, to make a kind of Ho'd to take off the Tumour, which is cut quite round to the Ribs with a very sharp Razor. The Cutting is usually begun in the lower Part, that so it may end in the Vessels near the Arm-pit, where a small piece of Flesh is left to stop the Blood with greater Facility: Then having laid a Piece of Vitriol upon the Vessels, or Bolsters soak'd in styprick Water; the Sides of the Breast must be prest with the Hand, to let out the Blood and Humours; and an actual Cautery is to be lightly apply'd thereto.

The Dressing.

The Wound is to be drest with Pledgins strew'd with Astringent Powders, a Plaister, a Com-

Compress, a Napkin round the Breast, and a Scapulary to support the whole Bandage.

But instead of these cross Threads, it is better to make use of a sort of *Forceps* turn'd at both Ends in form of a Crescent, after such a manner that those Ends may pass one over another, when the *Forceps* is shut. Thus the Surgeon may lay hold on the Breast, draw it to him, and after cut it off at one single Stroke with a very flat, crooked, and sharp Knife. Neither is it convenient to apply the Actual Cautery to stop the Hæmorrhage, because it is apt to break forth again anew, when the Escar is fallen off.

When the Tumour is not as yet ulcerated, a Crucial Incision may be made in the Skin, without penetrating into the Glandulous Bodies: Then the four Flaps being separated and rais'd, the Cancerous Tumour may be held with the *Forceps* and cut off. If there be any Vessels swell'd, they may be bound before the Tumour is taken away; but if the Tumour sticks close to the Ribs, the Operation is not usually undertaken.

C H A P. IX.

Of the Operation of the Empyema.

THIS Operation is perform'd when it may be reasonably concluded that some corrupt Matter is lodg'd in the Breast, which may be perceiv'd by the Weight that the Patient feels in fetching his Breath; being also sensible of the floating of the Matter when he turns himself from one side to another.

If the Tumour appears on the Outside, the Abscess may be open'd between the Ribs; but if no external Signs are discern'd, the Surgeon may choose a more convenient Place to make the Opening. Thus when the Patient is set upon his Bed, and conveniently supported, the Opening is to be made between the second and third of the Spurious Ribs, within four Fingers breadth of the Spine, and the lower Corner of the *Scapula*; to this purpose the Skin is to be cut up a-cross, to cut it in its Length, the Surgeon holding it on one side, and the Assistant on the other. The Incision is made with a streight Knife two or three Fingers breadth long, and the Fibres of the great Dorsal Muscle are cut a-cross, that they may not stop the Opening. Then the Surgeon puts the Fore-Finger of his Left-hand into the Incision, to remove the Fibres, and divides the Intercostal Muscles, guiding the Point of the Knife with his Finger, while he perforates the *Pleura*, for fear of wounding the Lungs, which sometimes

adhere thereto : The Orifice being thus made if the Matter runs well, it must be let out ; but if not, the Fore-Finger must be put into the Wound to disjoin those Parts of the Lungs that adhere to the *Pleura*.

To let out the Matter, the Patient must be oblig'd to lean on one side, stopping his Mouth and Nose, and puffing up his Cheeks, as if he were to blow vehemently ; then if Blood appears a greater Quantity of it may be taken away than if it were Matter, in regard that a Flux of Matter weakens more than that of Blood. It is also worth the while to observe, that in making the Incision, the Intercoastal Muscles ought to be cut a-croßs, that the Side of the Ribs may not be laid bare, by which means the Wound will not so soon become *Fistulous*.

If it be judg'd that purulent Matter is contain'd in both sides of the Breast, it is requisite that the Operation be made on each side ; it being well known that the Breast is divided into two Parts by the *Mediastinum* : But in this case the two Holes made by the Incision must not be left open at the same time, for fear of suffocating the Patient.

The Dressing and Bandage.

The Wound is dress'd with a Tent of Rags roll'd up, arm'd with some Balsam. This must be soft, and blunt at the End, and enter only between the Ribs for fear of hurting the Lungs ; but a good Dossil of Lint is more convenient than a Tent ; however a Thread must be ty'd to ei-

either of them, lest it shou'd fall into the Breast ; Pledgits must be put into the Wound, and a Good Plaister and Compress over all. This Dressing is to be kept on with a Napkin fasten'd round the Breast with Pins, and supported by a Scapulary. This is a sort of Band about Four Inches broad, having a Hole in the middle to let in the Head : One of its Ends falls behind and the other before ; and they are both fasten'd to the Napkin. Lastly, the Patient must be laid in Bed, and set half upright. If the Lungs hinder the running out of the Matter, a Pipe must be put in, and the Wound afterward dress'd according to Art.

C H A P. X.

Of the Operation of the Paracentesis of the lower Belly.

THIS Manual Operation is sometimes necessary in a Dropsie, when Watry Humours are contain'd in the Cavity of the Belly, or else between the Teguments. The Disease is manifest by the great Swelling ; and the Operation is perform'd with the Trocar, which is a Cane or a Pipe, made of Silver or Steel, with a Bodkin sharp-pointed at the End in it ; although the Ancients were wont to do it with a Lancet. The Patient being supported, sitting on a Bed, or in a great Elbow Chair, to the end that the Water may run downward,

a Servant must press the Belly with his Hands, that the Tumour may be extended, whilst the Surgeon perforates it three or four Fingers breadth below the Navel, and makes the Puncture on the side, to avoid the White-Line; but before the Opening is made, it is expedient that the Skin be a little raised up. After the Puncture the Bodkin or Wire is remov'd to let out the Water; and a convenient quantity of it is taken away, accordingly as the Strength of the Patient will admit. This makes so small an Orifice, that it is not to be fear'd lest the Water should run out, which might happen in making use of the Lancet, because there would be occasion for a thicker Pipe. When a new Puncture is requisite, it must be made beneath the former; but if the Waters cause the Navel to strut out, the Aperture may be made there, without seeking for any other place.

The Bandage and Dressing

Are made with a large Compress in four doubles kept on with a Napkin folded into three or four Leaves; and this is supported by the Scapulary.

The Operation of the Peracentesis of the Scrotum

Is undertaken when those Parts are distended with Water, after this manner: Assoon as the Patient is plac'd in a convenient Posture, either standing or sitting, the Operator lays hold on the

the *Scrotum* with one Hand, presseth it a little to render the Tumour hard, and makes a Puncture, as in the *Paracentesis* of the *Abdomen*. In an *Hydrocele* that happens to young Infants, the Puncture may be made with a Lancet, to let out all the Water at once: But in Men, especially when there is a great quantity thereof, it is better to do it with the *Trocar* or sharp-pointed Pipe; but the Testicles must be drawn back, for fear of wounding 'em with the Point of the Instrument.

If you judge the *Hydrocele* to be included in a Bag, the Membrane containing the Water is to be consum'd with Causticks, which is done by laying a Caustery in the place where the Incision should be made, and afterward opening the Escar with a Lancet.

When the Puncture is made, it ought to be done in the upper part of the *Scrotum*, because it is less painful than the lower, and less subject to Inflammation.

CHAP. XI.

Of the Operation of Gastroraphy.

THIS Operation is usually perform'd when there is a Wound in the Belly so wide as to let out the Guts. If there be a considerable Wound in the Intestine, it may be sow'd up with the Glover's Stitch; the manner of making which we have before explain'd. If the

Omentum or Caul be mortify'd, the corrupted Part must be cut off; for which purpose take a Needle with waxed Thread, and pass it into the sound Part a-cross the Caul, without pricking the Vessels. Then the Caul being ty'd on both sides with each of the Threads that have been pass'd double, may be cut an Inch below the Ligature, and the Threads will go through the Wound, and be ejected by the Suppuration. Next the Intestines must be put up again into the Belly, by thrusting 'em successively with the end of the Fingers. But if they cannot be restor'd to their proper place without much difficulty, Spirituous Fomentations may be made with an handful of the Flowers of Camomile and Melilot, an Ounce of Aniseeds, with as much Fennel and Cummin-seeds; half an Ounce of Cloves and Nutmegs: Let them be boil'd in Milk, adding an Ounce of Camphorated Spirit of Wine, and two Drams of *Saccharum Saturni*, with two Scruples of Oil of Aniseed, and bath the Guts with this Fomentation very hot. Or,

Apply Animals cut open alive; or else boil Skeins of raw Thread in Milk, and foment 'em with this Decoction in like manner very hot.

Before the Suture or Stitching of the Guts, foment 'em with Spirit of Wine, in which a little Camphire hath been dissolved. But if they be mortify'd, they must not be sown up again, but fomented with Spirituous Liquors. No Clysters are to be given to the Patient, for fear of causing the Guts to swell; but a Suppository may be put up: Or the Patient may use a Laxative Diet-Drink,

Drink, if it be necessary to open his Body: He ought also to be very temperate and abstemious during the Cure, and take no other Sustenance than Broths and Gellies.

If the Intestines cannot be put up again, the Wound must be dilated, avoiding the White-Line, and that too at the bottom rather than at the top, if it be above. To this purpose the Intestines are to be rank'd along the side of the Wound, and a Bolster is to be laid upon 'em dipt in warm Wine, which may be held by some Assistant. Then the Surgeon introduceth a Director or Channell'd Probe into the Belly, and takes a great deal of care to fix the Intestine between the Probe and the *Peritonæum*, which may be effected by drawing out the Intestine a little; then holding the Probe with his Left-Hand, to fit a crooked Incision-Knife in its channelling, he cuts the Teguments equally both on the out-side and within, and thrusts back the Entrails alternately into the Wound with his Fore-Finger.

The Stitch must be intermitted, being made with two crooked Needles threaded at each end with the same Thread. The Surgeon having at first put the Fore-Finger of his Left-Hand into the Belly, to retain the *Peritonæum*, Muscles, and Skin on the side of the Wound, must pass the Needle with his other Hand into the Belly, the Point of which is guided with the Fore-Finger, and penetrates very far: Then he likewise passeth the other Needle through the other Lip of the Wound into the Belly, observing the same thing as in the former, and without taking his Fingers off from

the Belly. If there are many Points or Stitches to be made, they may be done after the same manner, without removing the Fingers from the Part, whilst a Servant draws together the Lips of the Wound, and ties the Knots. Afterward the Wound may be dress'd, and the Preparatives or Dressings kept close on the Part with the Napkin and Scapulary. But the Patient must be oblig'd to lie on his Belly for some Days successively, to cicatrize the Wound thereof, or that of the Guts.

If the Intestine were entirely cut, it would be requisite to sow it up round about the Wound, after such a manner that some part of it may always remain open; for if the Patient should recover, his Excrements might be voided through the Wound; of which Accident we have an Example in a Soldier belonging to the Hospital *Des Invalides* at Paris, who liv'd a long time in this Condition.

C H A P. XII.

Of the Operation of the Exomphalus.

THIS Operation is necessary when the Intestines or Guts have made a kind of Rupture in the Navel, and may be perform'd thus: When the Patient is laid upon his Back, let an Incision be made on the Tumour quite to the Fat, by griping the Skin, if it can be, if not it may be done without it. Then let the

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Membranes be divided with a Fleam to lay open the *Peritonæum*, for fear of cutting the Gut ; and as soon as the *Peritonæum* appears, let it be drawn upward with the Nails, in order to make a small Opening therein with a Knife. And now the Surgeon having put the Fore-Finger of his Left-Hand into the Belly to guide the Point of the Scizzers, with which the Incision is enlarged, let him restore the Gut to its proper place, and loosen the Caul if it stick to the Tumour : if the Guts are fasten'd to the Caul, it is necessary to separate 'em by cutting a little of the Caul, rather than the Gut ; which last being reduc'd, let a Servant press the Belly on the Edge of the Wound. If there be a *Carnosity* in the Caul, form'd by its Adhesion to the Muscles and *Peritonæum*, this Fleshy Mass must be entirely loosen'd, and a Ligature made to take it away, with part of the Caul ; as we have already shewn in the *Gastrography*. Afterward the Stitch is to be made, as in that Operation, and the Wound must be dress'd, observing the same Precautions. The Dressing is to be supported in like manner with the Napkin and Scapulary.

C H A P. XIII.

*Of the Operation of the Bubonoccele,
and of the compleat Rupture.*

WHEN the Intestinal Parts are fall'n into the Groin or the *Scrotum*, the Operation of the *Bubonoccele* is to be perform'd : In order to this, let the Patient be laid on his Back, with his Buttocks somewhat high ; then stripping the Skin a-cross the Tumour, let the Surgeon hold it on one side, and the Assistant on the other, till he makes an Incision, following the Bending of the Groin ; when the Fat appears, let him tear off either with a Fleam, or with his Nails, every thing that lies in the way, till the Gut be laid open, which must be drawn out a little, to see if it do not cleave to the Rings of the Muscles. The Gut must be gently handled, to dissolve the Excrements ; and those Parts must be afterward put again into the Belly (if it be possible) with the two Fore-Fingers ; thrusting 'em alternatively ; but if they cannot be reduc'd, the Wound must be dilated upward, by introducing a Director into the Belly, which by its Channel guides the Point of the Scissors, and prevents their hurting the Part. If the Probe cannot enter, the Intestine must be taken out a little, laying your Finger upon it near the Ring, and making a small Scarification in the Ring, with a streight Incision-Knife guided with the Finger,

Finger, to give way for the Entry of the Director, into which may be put a crooked Knife, to cut the Ring; that is to say, to dilate the Wound on the inside; but care must be had to avoid penetrating too far, for fear of dividing a Branch of Arteries; and then the Parts may be put into the Belly. If the Caul caus'd the Rupture, it would be necessary to tie it, and to cut off what is corrupted, scarifying the Ring on the inside, to make a good Cicatrice or Scar.

The Dressing and Bandage.

The Dressing is made with a Tent of Rags, which ought to be soft and blunt at the end, and of a sufficient thickness and length, to hinder the Guts from forcing through the Rings by their Impulsion, a Thread being ty'd thereto, to draw it out as occasion serves. Then Pledgits are to put into the Wound, after they have been dipt in a good Digestive, such as Turpentine with the Yolk of an Egg, applying at the same time a Plaister, a Compress of a Triangular Figure, and the Bandage call'd *Spica*, which is made much after the same manner, as that in the Fracture of the Clavicle.

Of the compleat Hernia or Rupture.

It happens when the Intestinal Parts fall into the *Scrotum* in Men, or into the Lips of the Womb in Women. To perform this Operation, the Patient must be laid upon his Back; as in the *Bubonocoele*, and the Incision after the same manner;

ner. This must be continued into the *Scrotum*, tearing the Membranes till the Gut lie bare. Next it must be examin'd whether any Parts adhere to the Testicle; if the Caul does, it must be taken off, leaving a small Portion on the Testicle; but if it be the Gut, and those Parts cannot be separated without hurting one of 'em, it is better to take off part of the Testicle than the Intestine. If the Caul be corrupted, it must be cut to the sound Part. In the last place, the Wound must be dress'd with Pledgits, Bolsters, and Bandage *Spica* made as in the *Bubonocoele*.

C H A P. XIV.

Of the Operation of Castration.

THE Mortification or the *Sarcocoele* of the Testicles, gives occasion for this Operation. To perform it, the Patient must be laid upon his Back, with his Buttocks higher than his Head, his Legs being kept open, and the Skin of the *Scrotum* taken up, one end of which is to be held by a Servant, and the other by the Surgeon, who having made a longitudinal Incision therein, or from the top to the bottom, must separate the Fleshy Substance of the *Dartos* which covers the Testicle, and tie the Vessels, that lie between the Rings and the Tumour, cutting 'em off a Fingers breadth beneath the Ligature: But care must be taken to avoid binding the Spermatick

matick Vessels too hard, for fear of a Convulsion, and to let one end of the Thread pass without the Wound. If an Excrecence of Flesh stick to the Testicle, and it be moveable or loose it, must be taken off neatly, leaving a small Portion of it on the Testicle; and if any considerable Vessels appear in the Tumour, they must be tied before they are cut.

The Dressing and Bandage.

The Dressing is made with Dossils and Pledgets, with which the *Scrotum* is to be; and the proper Bandage is the *Suspensory* or Bag Truss. It has four Tails, the upper, as a Girth, goes round the Body; and the lower passing between the Thighs, are fastned behind to the Girth,

There is also another Bandage of the *Scrotum*, having in like manner four Tails, of which the upper make the Girth; but it is slit at the bottom, and hath no Seams; the lower Tails crossing one another, pass between the Thighs, and are join'd to the Girth. Both these sort of Bandages have a Hole to give Passage to the Yard.

C H A P XV.

Of the Operation of the Stone in the Urethra.

IF the Stone be stop't at the *Sphincter* of the Bladder, it ought to be thrust back with a Probe: If it stick at the end of the *Glans*, it may be press'd to let it out; and if it cannot come forth, a small Incision may be made in the opening of the *Glans* on its side.

But if the Stone be remote from the *Glans*, it is requisite to make an Incision in the *Ureter*; to which purpose, the Surgeon having caus'd the Skin to be drawn upward, must hold the Yard between his two Fingers, making a Longitudinal Incision on its side upon the Stone, which must be press'd between the Fingers to discharge it; or else it may be taken out with an Extractor. Then if the Incision were very small, the Skin needs only to be let go, and it will heal of it self; but if it were large, a small Leaden Pipe is to be put into the *Urethra*, lest it should be altogether clos'd up by the Scar. It is convenient to anoint the Pipe with some Desiccative Medicine, and to dress the Wound with Balsam. Lastly, a little Linnen Bag or Case is to be made, in which the Yard is to be put, to keep on the Dressing; but it must be pierc'd at the end, for the convenience of making Water, having two Bands at the other end, which are ry'd round the Waste.

C H A P. XVI.

Of Operation of Lithotomy.

THIS Operation is undertaken when it is certainly known that there is a Stone in the Bladder ; to be assur'd of which, it may not be improper to introduce a Finger into the *Anus* near the *Os Pubis*, by which means the Stone is sometimes felt, if there be any : The Finger is likewise usually put into the *Anus* of young Virgins, and into the *Vagina Uteri* of Women, for the same purpose. But it is more expedient to make use of the *Catheter*, anointed with Grease, after this manner : The Patient being laid on his Back, the Operator holds the *Yard* streight upward, the *Glans* lying open between his Thumb and Fore-finger ; then holding the *Catheter* with his Right-hand on the side of the Rings, he guides it into the *Yard*, and when it is enter'd, turns the Handle towards the *Pubes*, drawing out the *Yard* a little, to the end that the Duct of the *Urethra* may lie streight. If it be perceiv'd that the Probe hath not as yet pass'd into the Bladder, let him put his Finger into the *Anus* to conduct it thither. Afterward, in order to know whether a Stone be lodg'd in the Bladder, the Instrument ought to be shaken a little therein, first on the Right side, and then on the left ; and if a small Noise be heard, it may be concluded for certain that there is a Stone : But if it be judg'd that the Stone swims in the Bladder, so that it can-

cannot be felt, the Patient must be oblig'd to make Water thro' the *Catheter*.

Another manner of searching may be practis'd thus : Let the Yard be rais'd, inclining a little to the Side of the Belly ; let the Rings of the *Catheter* be turn'd towards the Belly, and the End on the Side of the *Anus* ; and then let this Instrument be introduc'd, shaking it a little on both sides to discover the Stone.

In order to perform the Operation of Lithotomy, the Patient must be laid along upon a Table of a convenient Height, so that the Surgeon may go about his Work standing ; the Patient's Back must also lean upon the Back of a Chair laid down, and trimm'd with Linnen Cloth, lest it shou'd hurt his Body ; his Legs must be kept asunder, and the Soles of his Feet on the Sides of the Table, whilst a Man gets up behind him to hold his Shoulders : His Arms and Legs must be also bound with Straps or Bands. Then a channell'd *Catheter* being put up into the Bladder, a Servant standing upon the Table on the Side of the Chair, holds the back of the Instrument between his two Fore-fingers on that Part of the *Perineum* where the Incision ought to be begun, which is to be made between his Fingers with a sharp Knife that cuts on both sides. The Incision may be Three or Four Fingers breadth, on the left Side of the *Raphe* or Suture : But in Children its Length must not exceed Two Fingers breadth. If the Incision were too little to give passage to the Stone, it wou'd be more expedient to enlarge it than to stretch the Wound with the *Dilaters*. When the Convex Part where the channelling of the *Catheter* is, shall be

well

well laid open, the Conductors may be slip't into the same Channelling, between which the *Forceps* is to be put, having before taken away the *Catheter*. Some Operators make use of a *Gorge* or *Introducer* to that purpose, conveying the End of it into the Channelling of the *Catheter*; which is remov'd to introduce the *Forceps* into the Bladder: And as soon as they are fixt therein, the Conductors or *Gorges* must be likewise taken out. Afterward, Search being made for the Stone, it must be held fast, and drawn out of the Bladder: But if the Stone be long, and the Operator hath got hold thereof by the Two Ends, he must endeavour to lay hold on it again by the middle, to avoid the great scattering which wou'd happen in the Passage. The Stones are also sometimes so large, that there is an absolute necessity of leaving them in the Bladder. Again, if the Stone sticks very close to the Bladder, the Extraction ought to be deferr'd for some time; and perhaps it may be loosen'd in the Suppuration. Lastly, when the Stone hath been taken out, an Extractor is usually introduc'd into the Bladder, to remove the Gravel, Fragments and Clots of Blood.

After the Operation, the Patient is carry'd to his Bed, having before cover'd the Wound with a good Bolster; and if an Hæmorrhage happens, it is to be stop't with Astringents: A Tent must also be put into the Wound, when it is suspected that some Stone or Gravel may as yet remain therein: But if it evidently appears that there is none, the Wound may be dress'd with Pledgits, a Plaister and a Bolster, of a Figure convenient for the Part. The Dressing may be kept up with

a Sling supported by a Scapulatory ; or else the Bandage of the double T. may be us'd, the manner of the Application of which we have shewn elsewhere. The Patient's Thighs must be drawn close one to another, and ty'd with a small Band, lest they shou'd be set asunder again.

The Operation of Lithotomy in Women is usually perform'd by the *Lesser Apparatus*, which is done by putting the Fore-finger and Middle-finger into the *Vagina Uteri*, or into the *Rectum* in young Virgins, to draw the Stone to the Neck of the Bladder, and keep it steady, so that it may be taken out with a Hook or other Instrument.

This Operation may also be effected in Women, almost in the same manner as in Men ; for after having caus'd the Female Patient to be set in the same Posture or Situation as the Men are usually plac'd, according to the preceding Description, the Conductors may be convey'd into the *Urethra*, to let in the *Forceps* between 'em, with which the Stone may be drawn out : But if it be too thick, a small Incision is to be made in the Right and Left side of the *Urethra*.

The *Lesser Apparatus* was formerly us'd in the Lithotomy of Men, after this manner : The Finger was put into the *Anus*, to draw the Stone toward the *Perineum* ; then an Incision was made upon the Stone on the side of the Suture, and it was taken out with an Instrument.

C H A P. XVII.

Of the Operation of the Puncture of the Perinæum.

THIS Operation is necessary in a Suppression of Urine, where the Inflammation is so great, that the *Catheter* cannot be introduc'd. Then an Incision is to be made with a Knife or Lancer, in the same Place where it is done in Lithotomy; and a small Tube or Pipe is to be put in the Bladder, till the Inflammation be remov'd.

C H A P. XVIII.

Of the Operation of the Fistula in Ano.

Fistula's are callous Ulcers: If one of these happen in the Fundament, and is open on the outside, it may be cur'd thus: After the Patient hath been laid upon his Belly on the side of a Bed, with his Legs asunder, the Surgeon makes a small Incision with his Knife in the Orifice of the *Fistula*, in order to pass therein another small crooked Incision-Knife, at the End of which is a pointed Probe with a little Silver Head which covers it, to the end that it may enter without causing Pain. When the Surgeon hath convey'd his Knife into the *Fistula*, having the Fore-finger of his

his Left-hand in the *Anus* or Fundament, he pulls off its Head, holding the Handle with one Hand, and the Probe that pierceth the *Anus* with the other; and at last draws out the Instrument to cut the *Fistula* entirely at one Stroke.

If the *Fistula* hath an Opening into the Intestine, an Incision is to be made on the Outside at the bottom thereof, to open it in the Place where a small Tumour or Inflammation usually appears, or else in the Place where the Patient feels a Pain when it is touch'd. If the Tumour be remote from the *Anus*, it may be open'd with the Potential Cautery, to avoid a greater Inconvenience. After having thus laid open the very Bottom, the little Incision-Knife and Probe, with its Head, is to be pass'd therein, the End of the Probe is to be drawn thro' the *Anus*, and the Flesh is to be cut all at once. But if the *Fistula* be situated too far forward in the Fundament, the *Sphincter* of the *Anus* must not be intirely cut, otherwise the Excrements cannot be any longer retain'd. Lastly, when the *Fistula* hath been treated after this manner, all its Sinuosities ought likewise to be open'd, and the Wound being fill'd with thick Pledgits steep'd in some Anodyn, is to be cover'd with a Plaister and a Triangular Compress, and the Bandage call'd the T. made.

C H A P. XIX.

Of the Suture or Stitching of a Tendon.

THIS Operation is made when the Tendons are cut, and big enough to bear it. If the Wound be heal'd, it must be open'd again to lay the Tendon bare, and the Part must be bended, to bring together their Ends. Then the Surgeon taking a flat, streight and fine Needle, with a double wax'd Thread, passes it into a small Bolster, and makes a Knor at the End of the Thread, which must rest upon the Bolster. Afterward he pierces the Tendon from the Outside to the Inside, at a good distance, lest the Thread shou'd tear it, and proceeds to pass the Needle in like manner under the other End of the Tendon, upon which is laid a small Bolster, for the Thread to be ty'd in a Knor over it. Then he causes the Extremities of the Tendons to lie a little one upon another, by bending the Part, and dresseth the Wound with some Balsam. It may not be improper here to observe, that Ointments are never to be apply'd to the Tendons, which wou'd cause 'em to putrifie, but altogether Spirituous Medicaments; and that the Part must be kept bent, lest the Extension of it shou'd separate the Tendons.

C A A P. XX.

Of the Cæsarian Operation.

W H E N a Woman cannot be deliver'd by the ordinary means, this bold and dangerous Operation hath been sometimes perform'd with good Success. The Woman being laid upon her Back, the Surgeon makēs a Longitudinal Incision beneath the Navel, on the side of the White-Line, till the Womb appears, which he openeth, taking great care to avoid wounding the Child: Then he divides the Membranes with which it is wrapt up, separates the After-burthen from the Womb, and takes out the Child. Lastly, he washeth the Wound with warm Wine, and makes the *Gastrography* or stitching up of the Belly, without sowing the Womb. After the Operation, Injections are to be made into the *Matrix*, to bring away the Blood; and a pierc'd Pessary must be introduc'd into its Neck.

C H A P. XXI.

Of the Operation of Amputation, with its proper Dressings and Bandages.

THE Leg is usually cut off about the Place where the Garter is commonly ty'd; the Thigh as near as can be to the Knee; and the Arm as near as possible to the Wrist: But an Amputation is never made in the Articulation except in the Fingers and Toes,

In order to cut off a Leg, the Patient is to be set on the side of his Bed, or in a Chair, and supported by divers Assistants; one of 'em being employ'd to hold the Leg at the bottom, and another to draw the Skin upward above the Knee, to the end that the Flesh may cover the Bone again after the Operation. In the mean while a very thick Bolster is laid under the Ham, upon which are made two Ligatures, viz. the first above the Knee to stop the Blood, by screwing it up with the *Torniquet* or *Gripe-stick*; and the second below the Knee, to render the Flesh firm for the Knife. Before the Ligature is drawn close with the *Gripe-stick*, a little Piece of Pasteboard is to be put underneath for fear of pinching the Skin. Thus the Leg being well fix'd, the Surgeon placeth himself between both the Legs of the Patient, to make the Incision with a crooked Knife, turning it circularly to the Bone, and laying one Hand upon the back of the Knife, which must have no Edge.

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Afterward the *Periostium* is to be scrap'd with a Ring Incision Knife, and the Flesh, with the Vessels that lie between the two Bones are to be cut. When the Flesh is thus separated, a cleft Band is to be laid upon it, with which the Heads are cross'd to draw the Flesh upward, to the intent that the Bones may be cut farther, and that it may cover 'em after the Amputation, as also to facilitate the Passage of the Saw. Then the Surgeon holds the Leg with his Left hand, and saweth with his Right, which he lets fall upon the two Bones, to divide them asunder at the same time beginning with the *Pevone* or *Fibula*, and ending with the *Tibia*. But it is necessary to incline the Saw, and to go gently in the beginning, to make way for it, and afterward to work it faster. The Leg being cut off, the Ligature must be untied below the Knee, loosening the *Gripe-Stick* to let the Blood run a little, and to discern the Vessels with greater Facility; and then the *Gripe-Stick* may be twisted again, to stop the Blood; which some Surgeons effect by Jaying Vitriol Buttons upon the Opening of the Arteries, and Astringent Powder on a large Bolster of Cotton or Tow, to be apply'd to the End of the Stump; but if such a Method be us'd, it is requisite that some Person be employ'd to keep on the whole Dressing with his Hand during Twenty four Hours. However this Custom hath prevail'd in the Hospital of *Hôtel Dieu* at Paris.

Others make a Ligature of the Vessels, taking up the Ends of them with a Pair of Forceps, having a Spring; or with the *Valot a Pain*, which is a sort of Pincers that are clos'd with a small Ring

Ring let down to the bottom of the Branches. These Pincers being held by a Servant, the Surgeon passeth a Needle with wax'd Thread, into the Flesh, below the Vessel, bringing it back again, and with the two Ends of the Thread makes a good Ligature upon the same Vessel; then he looseth the *Gripe-Stick* and the Band, the Stump is to be somewhat bended, and the Flesh let down to cover the Bones.

The Dressing and Bandage.

After the Operation, it is requisite to lay small Bolsters upon the Vessels, and dry Pledgits upon the Two Bones, as also many other Pledgits strew'd with Astringent Powders; and over all another large Bolster or Pledgit of Cotton or Tow, cover'd in like manner with Astringent Powders; then the whole Dressing is to be wrapt up with a Plaister and a Bolster, in form of a *Malta Cross*; so that there are three or four Longitudinal Bolsters, and one Circular.

The Surgeon usually begins to apply the *Malta Cross* and Bolster under the Ham, crossing the Heads or Ends upon the Stump, and causeth 'em to be held by a Servant that supports the Part; then he likewise crosseth the other Heads, and layeth on the two Longitudinal Bolsters that cross each other in the middle of the Stump, together with a Third Longitudinal, which is brought round about the Stump, to stay the Two former; These Bolsters ought to be three Fingers broad, and very long, to pass over the Stump. Afterward he proceeds to apply

The Bandage commonly call'd Capeline by French Surgeons.

This is made with a Band four Ells long, and three Fingers broad, roll'd up with one Ball, three Circumvolutions being made on the side of the Part which is amputated; the Band is to be carry'd upward with Rollers, passing obliquely above the Knee, and is brought down again over its former Turns. If it be thought fit to make this Bandage with the same Band, it must be let down to the Middle of the amputated Part, and carry'd up again to the Knee, many back-folds being made, which are stay'd with the Circumvolutions, till the Stump be intirely cover'd, and the whole Bandage wrapt up with Rollers or Bolsters.

The *Capeline* with Two Heads is made with a Band of the same breadth, but somewhat longer. This Band being at first apply'd to the middle of the Wound, the Heads are carry'd up above the Knee, and one of the Ends are turn'd backward to bring it down, and to pass it over the End of the Stump. At every back-fold which is form'd above and below the Knee, a Circumvolution is to be made with the other End of the Band, to strengthen the back-folds, continuing to bring the Band downward and upward, till the whole Stump be cover'd. Then Edgings are made round the Stump, and the Band is stay'd above the Knee. Afterward the Part may be brought to the Situation, cleans'd and cicatriz'd.

CHAP. XXII.

Of the Operation of the Aneurism.

THIS Operation is perform'd when the Surgeon hath prick'd an Artery, or when a Tumour ariseth in an Artery.

To this purpose the Patient is set in a Chair, and a Servant imploy'd in holding his Arm in a Posture proper for the Operation; then a Bolster is to be laid four double, following the Progress of the Artery, to the end that the Ligature may better press the Vessel; and the Arm may be also surrounded with another single Bolster, on which is made a Ligature screw'd up with a *Gripe-Stick*, provided the Arm be not too much swell'd; for in this Case it wou'd be more expedient to defer the Operation for fear of a Gangrene. The Artery being thus well stoppt, the Surgeon lays hold on the Arm with one Hand, below the Tumour, and with the other makes an Incision with his Lancet, beginning at the bottom of the Tumour, and ending on the top along the Progress of the Artery. When the Tumour is open'd, the coagulated Blood may be discharg'd with the Finger: and if there are any Strings at the bottom, they may be cut with a crooked Pair of Scissers, to the end that all the Clods of Blood, and other extraneous Bodies (which are sometimes form'd in *Aneurisms* when they are very inveterate) may be more easily remov'd. But the

Gripe-Stick must be loosen'd, to discover the Opening of the Artery with greater Facility, and the Artery separated from the Membranes with a Fleam; for it would be dangerous to cut it with a streight Incision-Knife: The Artery must also be supported with a convenient Instrument to divide it from the Nerve and Membranes; and to be assur'd of the Place of its Opening, the *Gripe-Stick* may be somewhat loosen'd, and afterward screw'd up again. In the mean time the Surgeon gives the Instrument to a Servant to hold, whilst he passeth under the Artery a crooked Needle with a wax'd String, cuts the Thread, and takes away the Needle: Then he begins to make the Ligature beneath the Opening of the Artery, tying at first a single Knot, on which may be put (if you please) a small Bolster, that may be kept steady with two other Knots: It is also necessary that another Ligature be made in the lower part of the Artery, by reason that the little lateral Arteries might otherwise let out Blood.

The Artery ought not to be cut between the Two Ligatures, lest the first Ligature shou'd be forc'd by the Impulsion of the Blood; but the Thread must be let fall, that it may rot with the Suppuration. Then the Wound may be dress'd with Pledgits, Bolsters strew'd with Astringent Powder and a Plaister; a Bolster being also laid in the bending of the Elbow.

The Bandage

Is made with a Band six Ells long, and an Inch Broad, roll'd up at one end, being at first applied with divers Circumvolutions under the Elbow, and moderately bound. Many turns are to be made, and a thick and streight Bolster, is to be laid upon the Tumour, (as in the Bandage for Phlebotomy) along the Artery, till it pass under the Arm-pit: The Arm and Bolster must be surrounded with the Band, which is brought up with small Rollers, to the Arm-pit, and stay'd with Circumvolutions round about the Breast. Afterward the Patient is to be laid in his Bed with the Arm lying somewhat bended on the Pillow, and the Hand a little higher than the Elbow.

C H A P. XXIII.

Of the Operation of Phlebotomy.

TO perform this Operation, the Surgeon holds the Lancet between his Thumb and Fore-finger, and three other Fingers lying upon the Patient's Arm, and thrusts the Point of the Lancet into the Vessel, carrying the same Point somewhat upward, to make the Orifice the greater. If a Tendon, which is known by its hardness; or an Artery, which is discover'd by Pulsation, appear beyond the Vein, and very near it, the Lancet must be only thrust into the

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Vein,

Vein, and drawn back again streight, without turning up its Point, otherwise the Artery or Tendon would be certainly cut with the Point. If the Artery or Tendon lies immediately under the Vein, the later must be prick'd somewhat underneath, holding the Lancet inclin'd side-ways, and thrusting it very little forward; so that the Point will finish the Opening, by turning it upward.

If the Artery adhere closely to the Vein, the later is to be prick'd higher or lower than it is ordinarily done; and if the Vein be superficial, and lie close upon a hard Muscle, the Lancet must not be thrust downright into the Vein, but it is requisite to carry it somewhat obliquely, and to take the Vessel above, lest the Muscle and its Membrane should be prick'd, which would cause a great deal of Pain, and perhaps a vehement Inflammation. It is well known that the Veins of the Right Arm are usually open'd with the Right Hand, and those of the Left Arm with the Left Hand.

The Bandage

Is made thus: The Surgeon having laid a Bolster upon the Orifice, keeps it close with two Fingers, and holds the Band or Filler with the other Hand; then taking one end of the Filler with the Middle-Finger, Fore-Finger, and Thumb, and applying it to the Bolster, he makes with the longest end of the Filler, divers Figures in form of the Letter X on the bending of the Arm; as also a backfold with the shorter end of the Filler, held between his three Fin-

Fingers. Afterward both ends of the Filler are ty'd beneath the Elbow.

If an Inflammation happens after the Operation, the Bolsters are to be dip'd in *Oxycrate* : but if the Orifice were so small as to produce a *Thrombus*, it would be requisite to press the Wound often with two Fingers, and immediately to apply a Bolster dip'd in *Oxycrate*.

C H A P. XXIV.

Of the Operation of Encysted Tumours.

IF the Tumours are small and pendulous, and have a narrow bottom, a Ligature may be made with Horse-Hair or Silk dip'd in *Aqua-Fortis*, which will cause 'em to fall off of themselves after some time ; or else they may be cut above the Ligature.

If the Tumour or Wen be thick , and its bottom large, a Crucial Incision is to be made in the Skin, without impairing the *Cystis* or Bag ; and when the Incision is finish'd, the Bag may be torn off with the Nails, or with the Handle of a Pen-Knife ; but sometimes it is necessary to dissect it. If there be any considerable Vessels at the Root, they may be bound or else cut ; and the Blood may be stopt with Astringents. If any parts of the *Cystis* remain, they are to be consum'd with Corrosives ; and the Lips of the Wound are to be drawn together without a Stitch, making use only of an agglutinative Plaister. But

if the Tumour adheres very close to the *Pericranium*, it is most expedient not to meddle with it at all.

Of Ganglions.

Ganglions are Tumours arising upon the Tendons and Nervous Parts, which may be cur'd by compressing them, and making a very streight Bandage, provided they be very recent: a resolvent Plaister is also to be apply'd to the Part.

CHAP. XXV.

Of the Operation of the Hydrocephalus.

THIS Operation is perform'd when it is necessary to discharge watry Humours out of the Head: If these Waters lie under the Skin, a very large Opening is to be made with a Lancet, and a small Tube or Pipe left therein to let 'em run out. If the Water lie between the Brain and the *Dura Mater*, the Membrane is to be perforated with a Lancet, after the Trepan hath been apply'd according to the usual Method, of which we have already given some account: Cauteries and Scarifications may be also us'd to very good purpose in this Disease.

C H A P. XXVI.

Of the Operation of cutting the Tongue-String.

WHEN the Ligament of the Tongue in Infants is extended to its Extremity, they cannot suck without difficulty; and when grown up, they have an Impediment in their Speech.

This Ligament may be cut with a little pair of Scizzers; to which Purpose the Thumb of the Left-hand being laid upon the Gum of the Lower-Jaw, to keep the Mouth open, the Tongue must be rais'd with the Fore-Finger of the same Hand, and the Scizzers pass'd between the two Fingers, to divide the String as near as is possible, to the Root of the Tongue, avoiding the Vessels: If an Hæmorrhage happens, recourse may be had to Styptic Waters. Afterward the Nurse must take care to let a Finger be often put into the Child's Mouth, to prevent the re-uniting of the String.

C H A P. XVII.

*Of the Operation of opening stopt
Ductus s.*

IF there be only one Membrane that stops the Entrance of the *Vagina*, an Incision may be made, and a Leaden Pipe put into it, having Rings to fasten it to the Waste, to hinder the re-uniting of the Wound.

If the Lips of the *Pudendum* are clos'd, the Patient must be laid upon her Back, and her Knees rais'd, in order to make an Incision with a crooked Incision-Knife, beginning at the Top; and then a Leaden Pipe is to be put into the Orifice.

If the *Vagina* be fill'd with a Fleshy Substance, an Incision must be made therein, till it be entirely perforated, putting at the same time a Leaden Tube into the Orifice.

If the Urinary *Ductus*, as well in young Boys as in Virgins, be stopt up, an Incision is to be made therein with a very narrow Lancet; and if a small Leaden Pipe can be conveniently introduc'd, it may be done; but it is not very necessary, in regard that Children are almost always making Water, which would of it self hinder the closing of the Orifice.

If the *Ductus* of the Ear be stopt with a Membrane, it must be perforated, taking care not to go too far, for fear of piercing the Mem-

Membrane of the Tympanum or Drum, and a small Leaden Pipe is to be put into the Opening.

If there be a carnous Excreſcence on the outside of the Ear, a Ligature ought to be made on it; or else it may be cut off with a Pair of Scizzers, and the rest of the Fleſhy Substance that remains in the Ear must be consum'd with Cauſticks, convey'd to the Part by the means of a small Tube, care being had nevertheless, to avoid hurting the Tympanum.

C H A P. XXVIII.

Of the Operation of the Phimosis and Paraphimosis.

W H E N the *Præputium* is so streight that the *Glans* can be no longer uncover'd, this Indisposition is call'd *Phimosis*; but if the *Præputium* be turn'd back above the *Glans*, after such a manner that it can no longer cover the same *Glans*, it is a *Paraphimosis*. If in the *Phimosis* the *Præputium* cleaves very close round the *Glans*, it is best to let it alone; but if in handling the *Glans* it be perceiv'd that it is moveable, or else that some parts of it only stick together, the Operation may be perform'd after this manner: The Patient being set in a Chair, let a Servant pull back the Skin to the Root of the *Penis*, to the end that the Incision may be made directly at the bottom of the *Glans*:

Glans : Then the Surgeon having drawn out the bottom of the *Præputium*, introduce a small Instrument with a very sharp Point on its flat side, at the end of which is fix'd a Button of Wax, pierces the *Præputium* at the bottom of the *Glans* on the side of the Thread, and finisheth the Incision by drawing the Instrument toward himself.

The *Paraphimosis* is cur'd by making Fomentations on the Part, to allay the Inflammation, if there be any ; and it is to be pull'd down with the Fingers. But if Medicinal Preparations prove ineffectual, Scarifications are to be made round about the *Præputium* ; and afterward convenient Remedies may be apply'd to remove the Inflammation, and prevent the Mortification of the Part ; so that at length the *Præputium* may be drawn over the *Glans*.

C H A P. XXIX.

Of the Operation of the Varix.

IN order to cure this Tumour, the Surgeon having first cut the Skin to discover the dilated Vein, separates it from the Membranes, and passeth underneath a crooked Needle with a double wax'd Thread ; then he makes a Ligature both above and below the dilatation of the Vein, opens the dilated Part with a Lancet, to let out the Blood, and applies a convenient Bandage : But without performing this

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Operation, the Vein might be open'd with a Lancet, to draw out a sufficient quantity of Blood; and then the *Varix* is to be press'd with a somewhat closer Bandage.

C H A P. XXX.

Of the Operation of the Panaritium.

THE *Panaritium* is an Abscess which ariseth at the end of the Fingers; some of the Tumours are only superficial, and others penetrate even under the *Periosteum*; nevertheless after whatsoever manner the *Panaritium* may happen, it ought to open'd on the side of the Finger, that the Tendons may not be hurt. If the Abscess be extended under the *Periosteum*, the opening must be made on the side, and the Lancet thrust forward to the Bone: Afterward the Pus or corrupt Matter is to be discharg'd, which would cause the Tendons to putrifie, if it should remain too long upon em.

The Dressing and Bandage

Are made with a Plaister cut in form of a *Malta Cross*, whose middle is apply'd to the end of the Finger, the Tails being cross'd round it. The Bolsters must be also cut in the shape of the *Malta Cross*, or of a plain Cross only; the Band being a Finger's breadth wide;

wide, and long enough to be roll'd about the whole Dressing, It must be pierc'd at one of its ends, and slit the length of three Fingers at the other; so that the two Heads may pass through the Hole, to roll up the Fingers with small Edgings.

C H A P. XXXI.

Of the Reduction of the falling out of the Anus.

TO reduce the *Anus* to its proper place when it is fallen out, the Patient being laid upon his Belly, with his Buttocks higher than his Head, the Operator gently thrusts back the Roll, made by the Protrusion of the Fundament, with his Fingers dip'd in the Oil of Roses. Then he applies Bolsters steep'd in some Astringent Liquor, which must be supported with a sort of Bandage, the Nature of which we shall shew in treating of the Fracture of the *Coccyx*, the T, the double T, or else the Sling with four Tails.

C H A P. XXXII.

Of the Reduction of the falling out of the Womb.

IN this Operation, the Patient being laid upon her Back, with her Buttocks rais'd up, Fomentations are to be apply'd to the Part; a Linnen Cloth is to be laid upon the Neck of the Womb which is out of its Place, and it is to be put up very gently with the Fingers, without using much force. If the Womb should fall out again, it would be requisite to convey a Pessary into it, after it hath been reduc'd; and to enjoin the Patient to lie on her Back with her Legs a-cross.

C H A P. XXXIII.

Of the Application of the Causticks.

A Caутery is an Ucer which is made in the Skin, by applying Causticks to it, after this manner:

The Surgeon having moisten'd the Skin for a while with Spittle, or else having caus'd a light Friction to be made with a warm Cloth, applies a perforated Plaister to the Parts, and lay the
Caustick

Cauſtick on the Hole, leaving it for a longer or ſhorter time, accordingly as he knows its Efficacy, or as the Skin is more or leſs Fine. Afterward he fortiſieth the Eſcar with his Lance, and puts a Suppurative, or piece of freſh Butter on the Part, till it be fallen off.

The Dreffing and Bandage.

After the Application of the *Lapis Infernalis*, or any other Cauſtick, it is neceſſary to lay on it a Plaſter, a Bolſter, and a Circular Bandage, which ought to be kept ſufficiently cloſe to preſs the Stone, having firſt put a Pea or little piece of Orice-Root, into the Ulcer to keep it open. Then the Patient is to make uſe of this Bandage, with which he may drefs it himſelf. Take a piece of very ſtrong Cloth, large enough to go round the Part without coming over it: And let three or four Holes be made in one of its ſides, as many ſmall Ribbans or Pieces of Tape being ſow'd to the other, which may be let into the Holes, as occaſion ſerves to cloſe the Band.

C H A P. XXXIV.

Of the Application of Leeches.

THE Leeches must be taken in clear running Waters, and be long and slender, having a little Head, the Back green, with yellow Streaks, and the Belly somewhat reddish. Before they are apply'd, let 'em purge during some Days in fair Water, fast half a Day in a Box without Water. Afterward the Part being rubb'd or chaff'd with warm Water, Milk, or the Blood of some Fowl, the Opening of the Box is to be set to the Part, or the Leeches themselves laid upon a Cloth; for they will not fasten when taken up with the Fingers. The End of their Tail may be cut with a Pair of Scissors, to see the Blood run, and to determine its Quantity, as also to facilitate their Sucking. When you wou'd take 'em away, put Ashes, Salt, or any other sharp thing upon their Head, and they will suddenly desist from their Work; but they are not to be pull'd off by force, lest they shou'd leave their Head or Sting in the Wound, which wou'd be of very dangerous Consequence. When they are remov'd, let a little Blood run out, and wash the Part with salt Water.

The Dressing.

Is made with a Bolster soak'd in some Stryptick Water, if the Blood will not otherwise stop; or in Brandy or *Aqua Vita*, if there be an Inflammation; and this is to be kept on with a Bandage proper for the Part.

C H A P. XXXV.

Of the Application of the Seton.

TO perform this Operation, a Cotton or Silk Thread is to be taken, after it hath been dip't in Oil of Roses, and let into a kind of Pack-Needle; then the Patient sitting in a Chair, is to hold his Head backward, whilst the Surgeon gripes the Skin transversely in the Nape of the Neck with his Fingers, or else takes it up with a Pair of *Forceps*, and passeth the Needle through the Holes of the *Forceps*, leaving the String in the Skin. As often as the Bolster that covers the *Seton* is taken off, that Part of the String which lies in the Wound is to be drawn out, and cut off.

C H A P. XXXVI.

Of Scarifications.

SCARIFICATIONS are to be made more or less deep, accordingly as Necessity requires, beginning at the bottom, and going upward, to avoid being hinder'd by the Hemorrhage. They must also be let one into another, that Strings may not be left in the Skin.

C H A P. XXXVII.

Of the Application of Vesicatories.

VESICATORIES are compounded with the Powder of *Cantharides* or *Spanish Flies*, mix'd with very sowre Leaven, or else with Turpentine. Before they are apply'd, a light Friction is to be made on the Part with a warm Cloth, and a greater or lesser Quantity is to be laid on, accordingly as the Skin is more or less fine, leaving 'em on the Part about seven or eight Hours; then they are to be taken away, and the Blisters are to be open'd, applying thereto some sort of Spirituous Liquor.

C H A P. XXXVIII.

Of the Application of Cupping-Glasses.

A Good Friction being first made with warm Clothes, lighted Tow is to be put into the Cupping-Glass, or else a Wax-Candle fasten'd to a Counter, and then it is to be apply'd to the Part till the Fire be extinguish'd, and the Skin swell'd, reiterating the Operation as often as it is necessary; and afterward laying on a Bolster steep'd in Spirit of Wine. These are call'd Dry Cupping-Glasses: but if you wou'd draw Blood, every thing is to be observ'd that we have now mention'd, besides that Scarifications are to be made, according to the usual manner; and the Cupping-Glass is to be set upon the Scarifications: but when the Cupping-Glass is half full of Blood, it must be taken off to be empty'd, and the Application thereof is to be re-iterated, as often as it is requisite to take away any Blood. Lastly, the Incisions are to be wash'd with some spirituous Liquor; and a Bandage is made convenient for the Part.

C H A P. XXXIX.

Of the opening of Abscesses or Im-
postumes.

AN Abscess or Impostume ought to be open'd in its most ripe Part, and in the Place to which the Tumours tend, endeavouring to preserve the Fibres of the Muscles from being cut, unless there be an absolute Necessity, avoiding also the great Vessels, Tendons and Nerves. The Opening must be rather large than small and not too much press'd in letting out the purulent Matter. If the Skin be thick, as it happens in the Heel, it may be par'd with a Razor; and if the Matter be lodg'd under the Nails, it wou'd be requisite to scrape 'em with Glasse before they are pierc'd.

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A
TREATISE
OF THE
OPERATIONS
OF
FRACTURES

CHAP. I.

Of the Fracture of the Nose.

WHEN the Fracture is considerable, the Nostrils are stop't up, and the Sense of Smelling is lost. In order to reduce it, the Surgeon takes a little Stick wrapp'd up in Cotton, and introduceth it into the Nostrils as gently as is possible, to raise up the Bones again, laying the Thumb of his Left-hand upon the Nose; to retain 'em in their Place. The Bones being thus set, he proceeds to prepare *The*

The Dressing and Bandage.

By conveying into the Nostrils certain Leader Pipes of a convenient bigness and Figure, which serve to support the Bones, and to facilitate Respiration. But Care is to be had to avoid thrusting 'em up too far, for fear of hurting the side of the Nose; and they are to be anointed with Oil of Turpentine mix'd with Spirit of Wine. These Pipes must have little Handles, with which they may be fasten'd to the Cap. If there be no Wound in the Nose, there will be no need of a Bandage; but if the Fracture be accompany'd with a Wound, after having apply'd proper Medicines, it will be requisite to lay upon each side of the Nose a Triangular Bolster, cover'd with a little piece of Paste-board of the same Figure. This small Dressing is to be supported with a kind of Sling that hath four Heads; being a Piece of Linnen-Cloth, two Fingers broad, and half an Ell long; it is slit at both Ends, and all along, only leaving in the middle a Plain of three Fingers, that is to say, a Part which is not cut. The Plain of the Sling is to be laid upon the Fracture, causing the upper Heads to pass behind the Nape of the Neck, which are to be brought back again forward; the lower Heads are likewise to be carry'd behind crossing above the upper, and afterwards to be return'd forward. If the Bones of the Nose be not timely reduc'd, a great Deformity soon happens therein, and a Stink caus'd by the Excrecences and Polypus's.

C H A P. II.

Of the Fracture of the lower Jaw.

THE Operator at first puts his Fingers in-
to the Patient's Mouth, to press the Pro-
minences of the Bones; and afterward doth
the same thing on the Outside. If the Bones
pass one over another, a small Extension is
to be made. If the Teeth be forc'd out of
their Place, they are to be reduc'd, and fas-
ten'd to the sound Teeth with a wax'd
Thread.

The Dressing and Bandage.

If the Fracture be only on one side, a Bolster
sow'd to a Piece of Paste-board is to be laid upon
the flat side of the Jaw, both being of the Figure
and Size of the Jaw it self. The Bandage of
this Fracture is call'd *Chevestre*, i. e. a Cord or
Bridle, by the French Surgeons, and is made by
taking a Band roll'd with one Head or End,
Three Ells long, and Two Fingers broad; the
Application of it is begun with making a Cir-
cumvolution round about the Head in passing o-
ver the Forehead; then the Band is let down
under the Chin, and carry'd up again upon the
Cheek, near the lesser Corner of the Eye in
passing over the Fracture; afterward it is rais'd
up to the Head, and brought down again under
the Chin, to form a Roller or Bolster upon the

Fracture : Thus three or four Circumvolutions and Rounds being made upon the Fracture, the Band is let down under the Chin, to stay and strengthen its several Turns, and is terminated round the Head, in passing over the Fore-head.

If the Jaw be fractur'd on both sides, it would be requisite to apply thereto a Bolster and Pastebord, perforated at the Chin, and of the Figure of the intire Jaw; the Bandage which we have even now describ'd, may be also prepar'd in making Turns on both sides of the Jaw: Or else the double *Chevestre* may be made with a Band of five Ells long, and two Fingers broad, roll'd up with Two Balls, that is to say, with Two Ends. The Application of his Band is begun under the Chin, from whence it is carry'd up over the Cheek, cross'd upon the Top of the Head, and brought down behind the Head, where it is cross'd again; Then it is let down under the Chin, cross'd there; and carry'd up over the Fracture; afterward the Band being pass'd three or four times over the same Turns, in making Rollers upon the Jaws, is turn'd upon the Chin, and stay'd upon the Forehead round about the Head.

A Remark of M^{ns}. Arnaud.

In all Fractures and Luxations of the Lower Jaw M. Arnaud uses only the *Fronde* or Sling with four Tails, large enough to embrace the whole Chin: it must have a Hole in the Middle of it to put the End of the Chin thro'; then it is to be apply'd like other Slings, by passing the Tails over the Head. This is far more convenient than any Bandages formerly in use.

CHAP.

CHAPTER III.

Of the Fracture of the Clavicle.

THE Patient is to be set in a Chair, and his Arm is to be drawn backward, whilst an Assistant thrusts his Shoulder forward: In the mean time the Operator sets the Bones again in their Place, by thrusting the Protuberances, and drawing out the sunk Bone.

Or else a Tennis-Ball may be taken, and put under the Patient's Arm-pit, whose Elbow is then to be prest against his Ribs, whilst the Surgeon reduceth the Fracture.

Otherwise the Patient may be laid upon his Back, putting a Convex Body under both his Shoulders, as a Bowl or large wooden Porringer; and then the Shoulders may be press'd, to raise up the two Ends of the Bones, which the Surgeon must take care to reduce.

The Dressing and Bandage.

The Cavities which are above and below the Clavicle, are to be fill'd with Bolsters trimm'd with Paste-boards; another is to be also laid upon the Bone, which is almost of the same Figure with the Clavicle, and a large Bolster, to cover the three others: This Dressing is to be secur'd with the Bandage call'd the *Capeline* or Head-bandage, provided the Fracture be in the middle of the Clavicle. A Band being taken

about six Ells long, and four Fingers thick, roll'd with two Balls; it is apply'd in the middle to the Fracture; one of its Heads or Ends is let down upon the Breast, whilst the other is pass'd behind the Back, below the Arm-hole, opposite to the indispos'd Arm-hole, and above the Breast, to be carry'd over the other End of the Band, which is rais'd up, to make an Edging upon the Fracture: The other End is pass'd under the indispos'd Arm-pit, and upon the Band that made the Roller, which is elevated by making a third Roller upon the Clavicle: These Circumvolutions round about the Body are continu'd, as also these Edgings upon the Clavicle, till it be intirely cover'd. Some Circumvolutions are also made upon the upper Part of the Arm, near its Head: The Space that lies between the Edgings and the Circumvolutions of the Arm, which bears the Name of *Geranium* or Storks-bill, is likewise cover'd with some Circumvolutions, and the Band is staid by making Circumvolutions quite round about the Body.

If the Fracture were near the Head of the *Humerus* or Arm-bone, a sort of Bandage might be prepar'd, which is call'd *Spica*, with a Band roll'd with one Ball five Ells long, and four Fingers broad; one End of this Band is pass'd under the Arm-pit opposite to the indispos'd one behind the Back: The other End is convey'd under the indispos'd Arm-pit; the Figure of the Letter X is made on the Shoulder; the Band is return'd below the other Shoulder behind; it is brought back again before, to form a second X upon the Fracture; three or four more are made upon the Fracture; two Circum-

convolutions are made in the upper part of the *Humerus*, which constitute a Triangle, call'd *Geranium*; This Triangle is cover'd with Edgings, and the Band is terminated round about the Breast.

C H A P. IV.

Remarks, with a new Machine of Monsieur Arnaud's for the Fracture of the Clavicle.

TO restore the Fractur'd Clavicle, let a Servant draw back both the Shoulders with both his Hands; putting his two Thumbs one against the other on the Spine, and let him manage the Shoulders with his Fingers, keeping the Patient in this Posture to give the Operator an Opportunity, to restore the Fractur'd Clavicle. After the Ends of the Bone are put together, the Servant must continue to keep them in the same Situation whilst the Dressings are apply'd; for if he should let go his Hold before that was done, they would fall out of their Places.

You must not lay any Bolster or Pastebord along the Clavicle, as is commonly done, because the Bandage pressing on it would cause it to fall out of its Place; but these must be laid above and underneath the Clavicles in the Cavities which are there, and lay a Roll above and under the Clavicle near its Articulation to the Shoulder, taking care that that below be longer

than that above. This is done by folding back diverse times the Compress. These Compresses must rise higher than the Clavicle, which is done by multiplying them, that the Band which keeps on the Dressing, may not thrust the Clavicle down. Next lay two Bolsters cross-wise, and cover all with a large Oval Pasteboard cut after the Fashion of a Heart, that so it may fit the Neck and Shoulder better, and keep all on with the Bandage call'd *Spica*, beginning by applying the End of the before on the Breast. And since the chief business is to keep the Shoulders back that the Bones may not fall out of their Places, you may make divers Turns of the Band to the middle of the Arm, beginning from before to behind; for if you shou'd begin the contrary Way, the Arm wou'd be drawn forwards, which is contrary to the Intention of the Operator, who must always draw the Shoulders back.

But as these Turns hinder the free Circulation of the Blood, and by consequence obstruct the Nourishment of the Arm, and are very troublesome to it, I shall describe a Machine of Mr. Arnaud's Invention, which answers all these Intentions without any of those Inconveniences.

A Machine of Mons. Arnaud's Invention for a Fracture of the Clavicle.

This Machine is a Cross or Steel-T, whose branches are about two Inches broad, and covered with some proper Stuff. The upright or long Stuff goes from the top of the Spine, beginning

between the Two Shoulders, and Ends at bottom. The Traverse must be fasten'd to the Top of the Upright, and pass across over both Shoulders. At the End of each Traverse there must be fastned a Plate of Iron as large as the Hand, which must be made like a Spoon, and hollow'd so as exactly and commodiously to embrace the Shoulder before, to draw the Shoulders back. This sort of Spoon must be rais'd a little round the Edges, and cover'd with some proper Stuff, that it may not hurt the Patient's Shoulders. This Spoon must contract it self as it goes backwards, making a sort of a Cuff. This Cuff is fastned behind to the Extremity of the Traverse, with a Screw. The Tail of one of these Spoons must open and have a Hinge: For when one is apply'd to one Shoulder, the other could not be apply'd to the other Shoulder without such a Devise. There must be at the Extremity, that is, at the foremost and largest a long Steel Rochet, which must go under the Patient's Arm-pit, and be fastned with a Strap behind to the Extremity of the Traverse of the Cross. You must put a Leather Strap at the bottom of the Cross to tie it round the Loins, and fasten it before on the Belly with a buckle; for by the help of this you may draw the Shoulders back more or less as it is ty'd more or less streight about the Body, and the bottom of the Cross plac'd higher or lower on the Back.

C H A P. V.

*Of the Fracture of the Scapula or
Shoulder-Blade.*

THE *Acromion* is usually fractur'd, but it may be known that the middle of the *Omo-plata* is broken by a Numbness which is felt in the whole Arm: Whereupon the Surgeon, after having examin'd the Place of the Fracture, thrusts back the Prominences of the Bones into their Place; and if any Splint happen to prick the Parr, he makes an Incision to take 'em out, or to cut off their Points.

The Dressing and Bandage.

A Bolster is laid upon the *Scapula*, as also a large Piece of Pasteboard of the bigness and figure of this Bone, and a sort of Bandage is prepar'd, known by the Name of *the Star*, with a Band roll'd with one Head four Ells long, and as many Fingers broad. This Band is convey'd behind the Back, one of its Ends lying under the Arm-hole, opposite to the indispos'd one; but the other is pass'd under the Shoulder, and afterward above it, to make an X in the middle of the Back; then passing under the other Arm hole, it is brought up to the Shoulder to be let down, and to form a second

X

X upon the middle of the Back : These Turns are continu'd in making Rollers, till the *Scapula* are all cover'd : Circumvolutions are also made round the upper part of the *Humerus*, as in the *Spica* ; and the Bandage is finish'd by Circumvolutions round about the Breast.

CHAP. VI.

Of the Fracture of the Ribs.

WHEN a Rib is broken, one of the ends pusheth into the Breast, sometimes on the outside ; and sometimes the Ends lie against each other. In order to reduce it, the Patient being laid upon the sound Rib, a Plaister of Mastick is apply'd to the Fracture ; and it is drawn out violently ; so that sometimes this Attraction brings back the Bone, which is advanc'd into the Breast, but the surest way is to make an Incision therein, to raise it up with the Finger.

If the Rib appear without, the Patient is to be set in a Chair, and must bend his Body on the side opposite to the Fracture, holding his Breath strongly, in order to dilate the Breast, whilst the Surgeon thrusts the Rib into its place.

The Dressing and Bandage.

A Bolster is to be apply'd to the Fracture, with two little Pieces of PASTE-board laid in form of a St. Andrew's Cross, and another Bolster upon the whole Dressing, on which is also laid a large square PASTE-board cover'd with a Bolster. The Bandage is made with a Napkin folded into three Folds, which is put round the Breast, being stitch'd too, and supported by the Scapulary; which is a Band six Fingers broad, perforated in the middle, to let in the Head. The two ends of the Scapulary are fasten'd before and behind to the Napkin.

CHAPTER VII.

Of the Fracture of the Sternum, or Breast-Bone.

TO reduce this Fracture, the Patient must be laid upon his Back, with a Convex Body underneath; and both his Shoulders press'd with some weight, to push em backward, and to raise up the Sternum, which is sunk down; or else an Incision may be made upon the Bone, to discover it; and then a *Vesicle* is to be apply'd thereto very gently, in order to raise it up into its place.

The Dressing and Bandage.

A Bolster and Paste-board are to be laid upon the *Sternum*, almost of the same Figure with the Part; and the Bandage is to be prepar'd with a Napkin supported with a Scapulary. Or else the Bandage call'd *Quadrige* may be made with a Band roll'd with two Heads, five Ells long, and four Fingers broad: The Application of this Band is begun under the Arm-pit; the Figure of X is form'd under the Shoulder; the Band is carry'd downward with the two Balls, one before, and the other behind; it is pass'd under the other Arm-hole; the Heads are cross'd upon the Shoulder, and it is brought down backward and forward, forming an X before and behind. Afterward the Band is roll'd about the Breast leaving Edgings, these Rollers are continu'd till it be terminated; and it is stay'd by a Circumvolution round the Breast.

C H A P. VIII.

Of the Fracture of the Vertebra's.

THE Processes of the *Vertebra* are commonly broken, and their Bodies but seldom: It may be known that the Body of the *Vertebra* of the Neck and Back is fractur'd by the Palsie of the Arm, accompanied with the

loss of Feeling ; by the suppression of Urine ; and by the Palsie of the *Sphincter* of the *Anus* ; so that the Excrements cannot be any longer retain'd. If these Symptoms appear, it may well be conceiv'd that the Marrow is compress'd, and prick'd with Points ; for the removing of which it is necessary to make an Incision upon the Body of the *Vertebra* in the fractur'd Place.

If the Spinal Processes are only fractur'd, these Accidents will not happen ; only some Pain will be felt : To reduce 'em, the Patient is to be laid upon his Belly, and the Surgeon must use his utmost Endeavours to raise up the Bone again, and to set it in its natural Situation.

The Dressing and Bandage.

If a Spinal Process were fractur'd, it would be requisite to apply to each side of it a small long Bolster, which is to be cover'd with a Paste-board of the same Figure with the Bolster ; another Bolster lying upon each Pasteboard. The Bandage is to be made with a Napkin sustain'd by its Scapulary ; or else the *Quadrige* may be used according to the manner we have already describ'd in the Fracture of the *Sternum*.

C H A P. IX.

Of the Fracture of the Os Sacrum.

IT is reduc'd as the other *Vertebra's*; but its Dressing and Bandage are made with the T perforated at the *Anus*, or else with the Π or double T. It is made with a Band two Fingers broad, and long enough to encompass the Body above the Hips; so that to the middle of this Band is fasten'd another Band of the same breadth, and of a sufficient length to pass over the Dressing of the *Os Sacrum*, as also between the Thighs, to be join'd in the fore-part to the first Cincture. The double T is made by fastening two Bands at a Finger's breadth distance one from another, to the Band which ought to be roll'd about the Body; and this sort of Bandage is to be supported with a Scapulary.

C H A P. X.

Of the Fracture of the Coccyx or Rump-bone.

THIS Bone is usually broken by falls, and sinks into the inside; so that to reduce it, the Fore-finger of one Hand is to be put into the

Anus

Anus or Fundament as far as the Fracture, to thrust it back again into its place, whilst the other Hand setteth it on the out-side.

The Dressing and Bandage.

These are the same with those in the Fracture of the *Os Sacrum*; but the Patient must be oblig'd to lie on one side, and to sit in a perforated Chair, when he hath a mind to rise.

If the *Os Innominatum* be broken the *Spica* is to be us'd after it hath been dress'd, of which Bandage we have given on Account in the Fracture of the Clavicle.

CHAPTER XI.

Of the Fracture of the Humerus or Arm Bone.

TO set this Bone, a strong Extension is to be made, if the two ends cross one another; to which purpose the Patient is to be plac'd on a little Stool or Sear, and supported by a Servant, two other Assistants being employ'd to draw, one at the upper-part, and the other at the lower, above the Elbow, and not beneath it. In the mean time the Operator reduceth the two Bones, by closing 'em on all sides with the Palms of his Hands, and afterward prepareth

The Dressing and Bandage.

It is necessary at first to lay round the Fracture a Bolster steep'd in some proper Liquor, as Claret or Oxycratum, then three several Bands are to be taken, three or four Fingers broad, and an Ell and a half long: The first of these is to be laid upon the Fracture round which are to be made three very streight Circumvolutions; then it is to be carry'd up with small Rollers to the top of the Arm, and stay'd round the Body. The second Band being apply'd to the Fracture, on the side opposite to the first, two Circumvolutions are to be made upon the Fracture, so that the same Band may be brought down along the whole length of the Arm, making divers Rollers, and at last stay'd below the Elbow, which, nevertheless, it must not cover. Afterward four Longitudinal Bolsters must be laid upon the Fracture round about the Arm, which are to be kept close with a third Band, joint being of no great Importance whether the Application of this third Band be begun at the top or at the bottom; but it may be stay'd round the Body, or else beneath the Elbow. The Arm ought also to be encompass'd with two thick pieces of Paste-board made round at the ends, and of the length of the Arm, but they must not cross one another. These Paste-boards are to be fasten'd with three Ribbands, and the Arm is to be put into a Scarf made with a large Napkin, which is to be first apply'd in the middle under the Arm-pit, the Arm resting upon it, so that the

the four ends may be rais'd up, and fasten'd to the opposite Shoulder; but the Hand must lie higher than the Elbow.

C H A P. XII.

Of the Fracture of the Bones of the Cubit.

IF both the Bones of the Cubit be broken, a stronger Extension is to be made than if only one of 'em were so hurt; to which purpose a Servant must grasp the Arm above the Elbow with both his Hands, and another must hold it above the Wrist, whilst the Surgeon sets the Bones with the Palms of both his Hands, till no unevenness be any longer felt in the Part.

The Dressing and Bandage.

Are the same with those of the Fracture of the Arm; but the Bands which are carry'd upward are to be stay'd above the Elbow. If the Patient be desirous to keep his Bed, it is convenient that his Arm be laid upon a Pillow, the Elbow lying something higher than the Hand.

C H A P. XIII.

Of the Fracture of the Carpus or Wrist-Bone.

IF the Bones of the *Carpus*, or those of the *Metacarpus* be fractur'd, a Servant must hold the Arm above the Wrist, and another the Fingers; whilst the Operator sets the Bones in their place, so as no unevenness may appear in the Part.

The Dressing and Bandage.

The Fracture of the Wrist is to be prepar'd with a Band roll'd with one Head, being six Ells long, and two Fingers broad; so that three Circumvolutions are to be made upon the Wrist; the Band is to be pass'd over the Hand, between the Thumb and the Fore-Finger, making the Figure of KY upon the Thumb. Then after having made divers Edgings on the *Carpus*, a Bolster is to be apply'd, with a little Piece of Paste-board of the same shape with the Wrist; several Edgings are to be made on the top of the Cubit to stay the Band above it; and the Arm is to be put into a Scarf.

C H A P. XIV.

Of the Fracture of the Bone of the Metacarpus.

TWO Servants are to hold the Hand, after the same manner as in the setting of the *Carpus* or Wrist-bone, whilst the Surgeon reduceth the broken Bone, by fixing it in its natural Situation.

The Dressing and Bandage

Are made with a Band roll'd up with one Head, five Ells long, and two Fingers broad: This Band being fasten'd to the Wrist, with a Circumvolution, is to be laid on the *Metacarpus*, between the Thumb and the Fore-finger, and the Figure of X is to be made upon the Hand. Then the forming of Rollers and X's is to be continu'd till the *Metacarpus* be cover'd; a Bolster and Pastebord are to be laid upon the same; as also one in the Hand, of the Shape of the Parr: The inside of the Hand is to be trimm'd; and the whole Contexture is to be cover'd as before, with Rollers, which are continu'd till above the Elbow, where the Band is stay'd.

CHAP. XV.

Of the Fracture of the Fingers.

A Light Extension is to be made in the Fingers to reduce 'em, and a small Dressing is to be prepar'd for every Finger, almost like that of the Arm. The Fingers are to be somewhat bent, and the inside of the Hand is to be trimm'd with a Bolster, to retain 'em in this Situation. The Bolster is also to be stay'd with a Band, and the Arm to be put into a Scarf

CHAP. XVI.

Of the Fracture of the Thigh.

IF the Thigh-bone be broken near its Head, the Fracture is very difficult to be discover'd; but if the Bones pass one over another it may be soon known, because the hurt Leg will be shorter than the other. Therefore a very great Extension is to be made; and if the Hands are not sufficient for that purpose, recourse may be had to Straps and Engines. In the mean time the Operator is to lay his Thumbs upon the fractur'd Bone, to thrust it back into its place, and afterward apply

The Dressing and Bandage.

The Caviry of the Thigh is to be fill'd with a thick Bolster, of the length of its bending; and Three Bands four Fingers broad are to be provided, the first being Three Ells long, and the second Four as well as the Third: Then Three Circumvolutions are to be made upon the Fracture with the first Band, carrying it up with small Rollers, and is to be stay'd round the Body. The second Band is to make Two Circumvolutions upon the Fracture, and is to be brought down with small Rollers, which are terminated above the Knee; or else they may be continu'd all along the Leg; it is also to be pass'd under the Foot, and to be drawn up again upon the Leg. Then a Bolster is to be apply'd to the lower part of the Thigh, being thicker at bottom than at top, to render the Thigh every where even; and four Longitudinal Bolsters are to be added, on which are laid Splints of the same length and breadth, which are to be wrapt up with a single Bolster. The Third Band is to be roll'd upon these Splints, beginning at the bottom, and ascending with Rollers. Then Two large Paste-boards are to be us'd, which may embrace the whole Dressing, without crossing one another, being fasten'd with Three Ribbands. Afterward, a Pair of Pumps is to be put under the Foot, and the Heel to be supported with a small Roll, the Thigh and Leg being laid in Junks, the inner of which is to extend to the Groin, and the outermost is

to be somewhat longer: Two little Cushions are also to be laid on each side below the Knee, and two others below the Ankles, to fill up the Cavities. These Cushions or large Bolsters are to lie between the Junks and a thick Bolster is to be laid upon the Leg all along its length, as also one upon the Thigh. The Junks are to be bound with three Ribbands for the Legs and as many for the Thighs; the Knots being ty'd without, and on the side.

CH A P. XVII.

A Remark of Mons. Arnaud on a Fracture of the Thigh.

THE External Junk must go quite under the Armpit, and be wrapp'd in two large Napkins folded lengthways, one of which must pass over the Belly, and the other over the Breast.

To hinder the Patient from turning cross and sliding down towards the Feet of the Bed, you must plant a Stake into the Floor, underneath the Bed, and pass it thro' the Matting and Bed-clothes, so that it may be between the Patient's Legs. This ought to be as thick as the Small of the Arm, and cover'd with some Stuff or other, that it may not hurt the Patient. And for greater Security, let it be ty'd with an equal Girth to the Patient's Thigh above the Knee, and let each Branch or Tail of the Girth pass on

on each side the Knee, exactly on the middle, and over two Pullies (fastned at the End of the Bed's-feet) and at the End of 'em yet there be two Weights suspended to draw the Thigh, and keep it in a streight Posture. The Thigh must be wrapt round with a Bolster in the Place where the Girth is, that it may not hurt it.

If you cannot or would not have this Weight or Stake, you must make use of Muffles, fastening one to the upper, and the other to the lower Part of the Thigh, and the End of the former to the Bed's-head, and the latter to the Bed's-feet.

Observe that these Muffles draw more or less strongly, and are more easie or troublesome as they consist of a greater or lesser Number of Pullies; and therefore that fastned to the lower End of the Thigh must not be so complicate as the upper one; that is, must have fewer Pullies, because it is this which must be loosen'd when the Patient complains they draw too hard.

C H A P. XVIII.

Reflections, and a New Machine of M. Arnaud for curing the Rotula, fractured transversely.

WHEN a Piece of the Rotula fractur'd transversely, is drawn up by the Attraction of the Extensors of the Leg, it ought to be

be thrust with the Thumbs into its ordinary Place.

In order to this, the Patient must not be laid down, as is most commonly done, but should sit in a Chair, and have his Leg extended; because in this Posture the Operator has more Strength to thrust the *Rotula* down with his Thumbs.

If there were nothing farther requir'd, for the Cure, but to keep the *Rotula* in its Posture, a common Bandage would be sufficient; but since this is never to be undone till the Cure be compleated, for fear the *Rotula* should be drawn out of its Place by the Muscles; and since there is no part stands in more need of being embrocated than the great Tendons of the Hams in that part of the Semi-Cylinder, Monsieur *Arnaud* has invented a new Machine to effect this without danger of the *Rotula's* flying up.

This Machine is made with a great and very thin Plate of Iron about a Foot long, bent round so as to form a hollow half Cylinder: It pretty well resembles half a Lanthorn without its Head, or being cut square at the End. You must make it lengthways, which must be placed under the Ham, a long Window like that of Horn Lanthorns, and must be shut with a Plate of Iron a little larger than the Aperture.

All along both Edges of this Cylinder there must be a Rising three Inches broad. Lay the Patient's Leg in the middle, which goes half a Foot above and as much below the Ham. Lay on this Machine that is above the Patient's Knees, a thin Iron Plate more than four Inches broad, which being shap'd handsomely round, must be ap-

applied on the Thigh, and one of its Ends touch the upper Edge of the *Rotula* to hinder it from rising.

This Plate on each side must have an Edge of Riling, which is to be apply'd on the Edges of the Semi-Cylinder, that is under the Ham, and kept on with a Screw. Lay another like Plate below the Knee, and let it just touch the inferiour Edge of the *Rotula*, which must be fasten'd like the other with Skrewws to the Cylinder to support the *Rotula* below the Knee. These Plates must come close to the Edges of the *Rotula*, and not pass over it; and this must be fasten'd so as to be put on or taken off at Pleasure, that so the *Rotula* lying between them may be kept from stirring. These Plates must be lin'd on the inside with Bolsters for the better keeping down the *Rotula*. The large Bolster laid on the Knees must have one End of it ingag'd under the Plate which lies above the Knees, but must not be ingag'd under the Plate that lies below the Knees, that so it may be taken up when the Part is to be dress'd without taking off the Plates that support the *Rotula*.

Let two Bolsters be likewise laid within the half-Cylinder, which is under the Ham; but so that they only touch one another at the Ends in the Middle of the Ham, and have only one of their Ends ingag'd between the half-Cylinder and the Leg, that so when the Plate under the Ham is taken, the Bolsters may fall down of themselves, and open a way to embrocate the Tendons. When that is done, put on the Plate again. The Description of this Machine is sufficient to instruct any ingenious Workman to make one.

Observe that when the *Rotula* is broke into diverse Pieces, you must press them down, and put each into its proper Place: for otherwise they would agglutinate each other in a wrong Position, and prove very inconvenient to the Patient after his Recovery whenever he should kneel down.

When these Pieces of the *Rotula* are reduc'd into their places, you must keep them there by two good Bits of Leather, three Inches broad laid Salterwise over the *Rotula*, fastning each End on the Plates of Iron, with Hooks made on purpose.

C H A P. XIX.

Of the Fracture of the Knee-Pan.

THE Knee-Pan is cleft or broken in divers pieces in its length, and cross-wise: if it be broken cross-wise or obliquely, the two pieces fly out one from another; and on this Occasion a strong Extension is to be made; whilst the Surgeon at the same time thrusts back again the upper part of the Knee-Pan into its Place.

If the Knee-Pan be fractur'd in its length, no Extension can be made, because the Pieces of the Bones remain in their place.

The Dressing and Bandage.

If the Knee-Pan be broken cross-wise, a Band is to be provided Three Ells long, and two Fingers broad, which may be roll'd with one or two Heads. The Application is to be be-

gun above the Knee-Pan; the Figure of X is to be made on the Ham, and a Circumvolution under the Knee; then the Band is to be continually carry'd up and down, till the Knee-Pan be intirely cover'd.

If the Knee-pan be fractur'd in its length, that is to say, from the top to the bottom, the Uniting-band must be us'd, being two or three Ells long, and two Fingers broad, perforated in the middle. It is to be at first apply'd under the Knee, and one of the Balls is to be pass'd thro' the Hole; it must also be well clos'd, and divers Circumvolutions are to be made upon the Knee-pan, to cover it intirely.

CH A P. XX.

Of the Fracture of the Leg.

IF the *Tibia* be only broken, it pushes into the Inside; But if both Bones be fractur'd, they are sometimes separated on both sides, or else they pass one upon another; and in this case the Leg is shorter than it ought to be. If the *Perone* be broken, it pushes to the outside.

If one Bone be only fractur'd, so strong an Extension is not requisite as when they are both shatter'd, and is to be drawn only on one side; whereas the drawing ought to be equal on both sides when both Bones are concern'd. Thus the Assistants are imploy'd in making the
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Extension; the Surgeon performs the Operation by laying the Ends of the Bones exactly against one another; and they are known to be reduced when the great Toe remains in its natural Situation.

The Dressing and Bandage.

A simple Bolster, dip'd in a convenient Liquor is at first apply'd, and three Bands three Fingers broad are prepar'd, the first being two Ells long, the second three, and the third three and an half. Three very streight Circumvolutions are to be made upon the Fracture; the Band is also to be carry'd up with Rollers, and stay'd above the Knee. The Application of the second Band is to be begun upon the Fracture with two Circumvolutions; it is to be brought down with Edgings to pass under the Foot, afterward carry'd up again and stay'd where it is terminated. The Cavity of the Leg is to be fill'd with a Bolster thicker at the bottom than at the top; and then are to be laid on the four Longitudinal Bolsters, two Fingers broad, and as long as the Leg; to which are to be apply'd the Splints of a pliable and thin Wood: These are wrapt up with a simple Bolster, and strengthen'd with the third Band, which is apply'd indifferen ly, either at the top or bottom, opposite to the former; so that it is carry'd up, or else down with Edgings, and stay'd at its End. The whole is to be encompass'd with large Paste-boards made round at the Ends, which are not to cross one another, but must be streighter at the bottom than the top, and are to

be ty'd with three Ribbands or pieces of Tape, beginning at the Middle; so that the Knots be ty'd on the outside. Afterward the Leg is to be put into the Junks, and the Heel is to be supported with a Linnen Roll, to which are fasten'd two Ribbands that are ty'd upon the Junks. These Rolls are made with a small piece of Cloth, which is doubl'd and roll'd up at the Ends, in which is contain'd some Straw, and a little Strick in the middle, to make them stiff. The Foot is supported with a Paste-board or Wooden Sole, trimm'd with a Bolster, or small Quilt sow'd over it. Divers Strings are also fasten'd to the middle of the Sides of the Sole or Pump, which are cross'd to be join'd to the Junks; and another is fix'd at the End of the Sole, which is ty'd to a Ribband that binds the middle of the Junk. These Junks are likewise fasten'd with three Ribbands, beginning with that in the middle, the Knots being without and trimm'd with four Bolsters, that is to say, two on each side, to fill up the Cavities that are below the Knee and above the Ankle. Lastly, the Leg is to be plac'd somewhat high, and a Cradle to be laid over it to keep off the Bed-clothes; the Junks must go over the Knee and Foot.

The Dressing of complicated Fractures.

Of the Arms, Legs, and Thighs, is made with a Bandage having eighteen Tails or Ends, in order to make which, a Linnen Cloth is to be taken of the Length of the Part, and broad enough to encompass it: it is to be folded into three Leaves,

Leaves, and cut in three places on each side, leaving the middle plain; so that eighteen Tails or small Bands are form'd, every one of which will be four Fingers broad, the upper Tails being a little shorter than the lower. This Band of eighteen Tails is to be laid upon the Junks, and a Bolster is to be apply'd to it four Fingers broad, as long as the Junks. The Leg is laid upon this Bolster, and it keeps the *Wound* from falling on the Bandage.

When the Wound hath been dress'd, the Fracture must presently be wrapp'd round with one of the Tails, which ought to cross one another. Then after the Leg hath been bound with the first Tails, two Longitudinal Bolsters are to be apply'd to the side of it; and the other Tails are to be rais'd, with all the rest of the Dressing, which hath been describ'd in the simple Fracture.

CHAP. XXI.

Excellent and Judicious Remarks of Monsieur Arnaud on Fractures of the Leg and Arm.

Monsieur Arnaud shew'd that the Roll put under the Heel to support it is insignificant, because it compresses the Tendons; but the best way is to use a small Roll of Cloth, which must be put under the Leg between the Heel and the Dressing that is under the Tendon of *Achilles*.

He shew'd likewise that if after some time the Patient be tired with this, it may be taken off, and two false Junks made without a Stick or Straw, with a Band about three Inches broad, roll'd with two Heads, which must support the two Ankles, while the Heel rests on that part of the Band which is between the two Heads. If after some time, the Patient be fatigu'd, you may take this off and put on the former, shifting thus alternately for his Relief. If you chuse rather to make use of the Roll, you must have a longish Bolster or Cushion to fill up the Hollowness of the Leg on each side of the Tendon of *Achilles*.

He shew'd that the great Junks in which the Legs are laid, ought not to go above three Inches higher than the Knee. For if they should go to the upper End of the Thigh, that being thicker than the Leg, this could not be supported by the Junks, that is, if to support them, the Junks were brought close to the Legs, they would recede from the Thigh.

He shew'd farther, that a Pillow ought to be laid under the Ham, for fear of a Distortion, and that this Pillow should be thickest in the Hollow of the Ham.

He recommended very much the keeping the Foot streight with a Sole. That this Posture be not natural to the Foot, since in sleeping it is bent, and is tir'd by being kept streight. The reason why this is done, is to keep the Tendon of *Achilles* from contracting it self, which would oblige the Patient to walk on the Tip of his Foot.

The Paste-boards laid round the Leg must not be engag'd under the Bands, because if the Patient should

should complain he is too closely bound, he cannot be reliev'd but by undoing the Bandage, which may do considerable Mischief. Whereas if the Plaster-boards are ty'd with two or three Ribbands only, they need only be slackn'd to give ease to the Part.

The Bones of the Cubit or Leg must by no means be prest by the Bandage, for fear, instead of being kept together, they fall into the Interstice between the Bones. The Arm both within and without must be cover'd with Longitudinal Bolsters, which rise higher than the Bones, that the Bandage may rest on this, and not press on the Bones.

If there is but one Bone in the Arm broken, there is no need the above-mention'd Bolsters should rise above the whole Bone: For this may be cover'd with a Bolster laid lengthways, and the Bandage supported on it.

C H A P. XXII.

Of the Fracture of the Bone of the Foot.

THE Reduction of the Bone of the Foot is perform'd after the same manner as that of the Hand.

The Dressing and Bandage

Are made with a Band roll'd with two Heads, being three Ells long, and two Fingers broad: The Application of it is begun with a Circumvolution above the Ankles; it is pass'd on the Foot, and in like manner makes a Circumvolution round it: Afterward the same Band is cross'd over the *Metatarsus*, upon which are made some Folds in form of a *Rhombus* or Diamond; as also on the Toes, and it is stay'd above the Ankle-Bone; or else it is carry'd up along the Leg, to be stay'd above the Knee. This Bandage serves for all Fractures of the Bones of the Foot, and is call'd the *Sandal*.

CHAP. XXII.

THE Reduction of the Bone of the Foot is performed after the same manner as that of the Hand.

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CHAP. I.

Of the Luxation of the Nose.

THE Bones of the Nose may be separated from that of the Forehead by a Fall, or some violent Blow; and the Surgeon in order to set 'em, at first lays his Thumb upon the Root of the Nose; then he introduceth a little Stick trimm'd with Cotton, into the Nostrils, and by the means thereof puts back the Bones into their Place.

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The Dressing and Bandage

Are the same with those that have been already describ'd in the Fracture of the Bones of the Nose.

C H A P. II.

Of the Luxation of the lower-Jaw

THE Jaw may be luxated either on both sides, or only on one. When the Dislocation happens on both sides, it hangs over the *Sternum* or Breast-bone, and the Spittle runs abundantly out of the Mouth: To reduce it, the Patient must sit down, and his Head is to be supported by a Servant; then the Operator or Surgeon having wrapt up his two Thumbs, puts 'em into the Mouth upon the Molar Teeth, his other Fingers lying under the Jaw, which is to be drawn down by raising it up, having before set two small Wooden Wedges upon the two Molar Teeth on both sides of the Jaw, lest the Surgeon's Fingers should be hurt, as the Bone is returning to its place.

If the Luxation be forward, a Band or Strap is to be put under the Chin, an Assistant having his Knees upon the Patient's Shoulders, where he is to draw the Strap upward, to facilitate the Extension; which the Surgeon makes with his Hands, at the same time thrusting the Bone back again into its place.

When

When the Jaw is luxated only on one side, the Chin stands a-cross, and the dislocated side is depress'd, a small Cavity being perceiv'd in it, and a Rising on the other side; so that the Mouth cannot be shut close, but remains somewhat open, the lower Teeth appear farther out than the upper; and the Canine or Dog-Teeth lie under the Incisive. This Luxation is reduc'd by giving a blow with the Hand upon the luxated Bone, which is sufficient to cause it to re-enter its natural Place.

The Dressing and Banuage

Are altogether the same with those us'd in the Fracture of the Bones of the lower Jaw.

C H A P. III.

Of the Luxation of the Clavicle.

THE *Clavicle* is easier loosen'd from the *Acromion* than from the *Sternum*; when it hath left the former the Arm cannot be lifted up; the *Acromion* makes a Prominence, and the *Clavicle* descends downward, a Cavity appearing in its place. To reduce this Luxation, the Patient must be laid down, and some Convex Body put between his Shoulders: both which are to be press'd backward, to raise up the *Clavicle*: Afterward he is to be set in a Chair, that his Arm may be drawn backward, whilst the Surgeon

geon is employ'd in pressing the Clavicle and *Acromion*, to join 'em together.

The Dressing and Bandage

Are the same with those that we have already shewn, in treating of the Fracture of the Clavicle.

C H A P. IV.

Of the Luxation of the Vertebrae.

IN the Luxation of the *Vertebra* of the Neck, the Head stands to one side, and the Face is swell'd and livid, with a difficulty of Respiration.

To reduce this Dislocation, the Patient is to be set upon a low Seat, an Assistant leaning on his Shoulders, to keep his Body steady, whilst the Surgeon or Operator draws his Head upward, and turns it from one side to another: Then if the Accidents or Symptoms cease, the Cure is perform'd; so that Fomentations may be apply'd to the Part; and the Patient being laid in his Bed, must take care to avoid moving his Head.

When the *Vertebra* of the Back or Loins are luxated on the inside, a sinking of the Bone is soon perceiv'd; whereupon the Patient being laid on his Belly, the Extension is made with Napkins pass'd under the Arm-pits, and upon the Os *Ileum*, whilst the Surgeon with a strong Extension

renson makes some Efforts on the Spine, endeavouring to draw back the *Vertebra*. If that be not sufficient, an Incision is to be made upon the *Apophysis Spinosa* of the *Vertebra*; so that after having laid open this Process of the Bone, it may be taken out with a pair of *Forceps*. Then the Wound is to be dress'd with Pledgits, a Plaister, and a Napkin, which must not be bound too close for fear of pushing back the Spine.

When the *Vertebra* is luxated on the outside, a Prominence appears; so that to reduce this Dislocation, the Extension is to be made as before, the Patient lying in like manner upon his Belly; but in order to push back the *Vertebra*, two little Sticks trimm'd with Linnen-Cloth are to be prepar'd, and laid along the two sides of the Spine of the *Vertebra*; yet these Sticks ought to be thick enough to remain more elevated than the Spinal Process, and a large Wooden Roller is to be often roll'd upon 'em, which by its turning backward and forward, may thrust the *Vertebra* inward: so that when all the *Vertebrae* are of an equal height, the Reduction is finish'd. If the *Vertebra* are luxated on the side, the same Extensions are to be made, and the Prominence is to be push'd, to re-establish the *Vertebra* in its place.

The Dressing and Bandage.

The Dressing is prepar'd by laying two thin Plates of Lead on each side of the Spinous Process of the *Vertebra*, to maintain it in its Place, and a long Bolster over 'em. The proper Bandage

days is the *Quadrige*, which hath been before described in treating of the Fractures of the Breast-Bone.

CHAP. V.

Of the Luxation of the Coccyx or Rump-Bone.

IF the *Coccyx* be sunk on the inside, it is to be raised with the Fore-finger of the Right-hand put into the *Anus*; and if the Luxation be on the outside, it may be gently thrust back again. An Account of its proper Dressing and Bandage hath been already given in the Fracture of the *Coccyx*.

C A A P. VI.

Of the Bunch.

THE *Bunch* is nothing else but an exterior Luxation of the *Vertebrae*, and for the Cure thereof, it would be requisite to keep Emollients for a long time upon the *Vertebrae* to loosen the Ligaments, and to wear Iron-Bodice; which in compressing the *Vertebrae* by little and little, might perhaps drive 'em back into their natural Place.

C H A P. VII.

Of the Luxation of the Ribs.

THE Ribs are luxated either on the outside, or on the inside: If they be dislocated on the inside, a Cavity is perceiv'd near the Sternum, the Patient drawing his Breath with Pain, and not being able to bend his Body.

When the Luxation is on the outside, and happens in the upper Ribs, the Patients Hands are to be hoisted upon the top of a Door, to raise up the Ribs, whilst the Surgeon presseth the Prominence of the Rib to restore it to its place.

When the lower Ribs are luxated, the Patient must be oblig'd to stoop, laying his Hands upon his Knees, and the Prominence of the Bone is to be thrust back.

If a Rib be luxated on the inside, an Incision is to be made to draw it out with the Fingers.

The Dressing and Bandage

Are the same with those that are us'd in the Fracture of the Ribs.

C H A P. VIII.

*Of the Sinking of the Xiphoides, or
Sword-like Cartilage.*

TO raise up the *Xiphoid Cartilage*, it must be fomented before for some time with Oil of Turpentine, or other Fomentations, made with Aromatics; then the Patient is to be laid upon his Back, with a Convex Body underneath, and the Shoulders and sides of the Breast are to be press'd to lift up the Cartilage. When this Operation is not sufficient, dry Cupping-Glasses are usually apply'd till the Part be elevated, and a strengthening Plaister is afterward laid upon it.

C H A P. IX.

*Of the Luxation of the Humerus, or
Arm-Bone.*

THE Head of the *Humerus* generally falls under the Arm-pit, so that the luxated Arm becomes longer than the other. The *Acromion* appears pointed on the outside; the Elbow is turn'd from the Ribs, and cannot be mov'd without great Pain. To reduce this Bone, the Patient is to be set upon a low Seat, or else on the

the Ground, whilst some Person supports his Body with a Napkin: In the mean time the Surgeon must lay hold on the upper part of the *Humerus*, a Servant kneeling behind him, who is to hold the Patient's Arm above the Elbow, which is to pass between the Surgeon's Legs, and is to be drawn down by the Assistant as much as is possible, whilst the Surgeon in like manner draws the Arm, to remove the Head of the Bone out of the place where it was stopt; insomuch that the Bone sometimes makes a noise in re-entering its Cavity.

Or else the Patient's Arm may be laid upon the Shoulder of a taller Man than himself, who is strongly to draw the luxated Arm upon the Fore-part of his Breast; during which time the Operator must push the Head of the *Humerus*, and thrust it into its Cavity.

Otherwise the Patient may lie on the Ground, a Tennis-Ball being put under his Arm-pit, which a Servant must draw strongly with a Handkerchief pass'd under the Shoulder, whilst another Assistant stands behind the Patient, to thrust down the Shoulder with his Foot; at the same time the Surgeon sitting between the Patient's Legs, must push strongly with his Heel the Ball that lies under the Armhole.

Or else a thick Battoon or Leaver may be laid on the Shoulders of two Men; after a Tennis-Ball hath been nail'd on the middle of it; otherwise a Bunch may be made therein; and cover'd with Linnen Cloth; two Wooden Pins being also fix'd on each side of the Ball: Then the Patient's Arm-pit is to be set between those two Pins, and upon the Ball, where he is

to

to remain hanging, whilst his Arm is pull'd down by main force. The same thing may be done by laying the Patient's Arm-pit upon a Door, or else upon the Round of a Ladder.

The Dressing and Bandage.

A little Ball of Linnen is to be laid under the Arm-pit, and underneath a Bolster with four Heads, which are cross'd upon the Shoulder; as also a Bolster under the sound Arm-hole, that it may not be gall'd by the Bandage Spica, the Nature of which we have shewn in treating of the Fracture of the Clavicle.

CHAP. X.

Of the Luxation of the Elbow.

WHEN the Elbow is luxated on the inside, the Arm lies out, and the Hand is turn'd outward; but in the Luxation on the outside, the Arm is shortned: If the Luxation be Lateral, a Prominence appears in the Dislocated, and a Cavity in the opposite Parr.

To reduce the Internal Luxation, the *Humerus* and *Cubitus* are drawn, and at the same time the Surgeon bends the Elbow, by carrying the Hand toward the Shoulder; or else a Tennis-ball may be laid in the Fold of the Elbow, and the Arm drawn towards the Shoulder.

For

For the External Luxation, the Extension is to be made, whilst the Surgeon thrusts back the Elbow into its place: or else a round Stick may be taken, and trimm'd with Linnen-Cloth, with which the Bone is to be push'd back into its place during the Extension. This Stick may be also us'd in the reducing of the Internal Luxation.

For the Lateral Luxations, the Extension may be made in like manner; the Surgeon at the same time thrusting back the Bone into its natural Situation.

The Bandage

Is made with a Band five Ells long, and two Fingers broad, roll'd with one Ball: The Application of it is begun with a Circumvolution at the lower part of the *Humerus*, thence it is pass'd over the Bending of the Arm; a Circumvolution is also form'd in the upper part of the Cubit, and an X on its Bending. Afterward the Edgings are continu'd upon the Cubit, and the X's in the middle of the Arm, till the Cubit be entirely cover'd: The Band is likewise carry'd up to the top of the Arm with Edgings, and lay'd round about the Body. The Patient must be oblig'd to keep his Bed, or else his Arm may be put in a Scarf, after the same manner as in the Fracture of the Arm.

C H A P. XI.

Of the Luxation of the Wrist.

IF the Luxation be Internal, the Hand is turn'd Back to the outside, so that for the Reduction thereof, it would be requisite to cause the back of the Hand to be laid upon a Table, and the Extension to be made by drawing the Cubit and Hand, whilst the Surgeon takes care to press the Prominence.

If the Luxation be external, the Hand is bend'd on the inside; so that to reduce it, the inside of the Hand is to be laid upon a Table, and the Surgeon is to press it after the Extension.

If the Luxation be on the sides, the Hand is turn'd to one side; so that the Extension must be made, and the Hand turn'd on the side opposite to the Luxation. But the Fingers are usually drawn one after another, to the end that the Tendons may be set again in their Place.

The eight Bones of the *Carpus* may be in like manner dislocated both on the inside and without; and to set 'em right, the Hand is to be laid upon a Table, and the Extension to be made, so as to press the Protuberances on the inside, if the Luxation be internal, and on the outside of it be external.

The Bandage

Is made, with a Band six Ells long, and two Fingers broad; so that three Circumvolutions may be made, upon the Luxation; as also divers Edgings in passing through the inside of the Hand between the Thumb and the Fore-finger, and in forming the Figure of X upon the Thumb; after having made many Edgings upon the Wrist. Two Pieces of Paste-board are also to be laid on sides of the Wrist, which are bound with the same Band; and the Hand is to be kept open with a Linen-Ball, to keep the Fingers in their Situation. Then the Band is to be pass'd above, to strengthen it, and carry'd up with Edgings the whole length of the Cubit, to be stay'd below the same Elbow.

CHAP. XII

Of the Luxation of the Fingers.

[F the Fingers be luxated, it is necessary to make an Extension to reduce 'em, and afterward to use the following

Bandage.

If the Luxation be in the first Articulation or Joint, the Bandage *Spica* is to be apply'd, being made of a Band roll'd with one Head, an Ell

Ell long, and an Inch broad : It is begun with Circumvolutions round about the Wrist, and brought over the Luxation in passing between the Fingers. These Circumvolutions are also continu'd to form a *Spica* upon the Luxation, and the Band is stay'd at the Wrist.

If all the first *Phalanges* were dislocated, it would be requisite to make as many upon every *Phalanx*, and with the same Band : This sort of Bandage is call'd the *Demi-Gauntlet*.

C H A P. XIII

Of the Luxation of the Thigh.

THE Luxation which most commonly happens in this Part, is the Internal ; so that a Protuberance appears on the Hole of the Os *Pubis* ; the indispos'd Leg is longer than the other, and the Knee and Foot turn outward ; neither can the Thigh be any longer bended, nor drawn near the other.

If the Luxation be external, the Leg becomes shorter than the other, the Knee and Foot turning inward, and the Heel to the outside.

When the Luxation is on the fore-part, a Tumour ariseth in the Groin, so that the Patient cannot draw his Thigh toward the other, nor bend the Leg ; his Body resting only upon the Heel.

If the Luxation be Posterior, a Tumour is felt in the Buttocks with great Pain, and the Leg is shorter than it ought to be: There also appears a sinking in the Groin, the Leg is lifted off from the Ground, and the hurt Person is apt to fall backward.

To reduce the Internal Luxation, the Patient is to be laid with his Back upon a Table, to which is fix'd a thick Wooden Pin, about a Foot long, which is to be set between his Thighs, to detain his Body when his Legs are drawn down; then a Strap is to be pass'd above the Joint of the Thigh, to draw the *Ischion* upward, and the Thigh is to be drawn down with another Strap fasten'd above the Knee: In the mean while the Surgeon thrusts the Thigh upward, to cause its Head to re-enter its Cavity, the Straps being somewhat loosen'd in the time of the Reduction to facilitate the Operation.

To reduce the external Luxation, the Patient is to be laid upon his Belly; and the drawing to be perform'd after the same manner as we have even now shewn, whilst the Thigh is thrust from the outside inward, to cause the Bone to re-enter its Cavity.

In reducing the Anterior Luxation, the Hurt Person is to be laid upon the side opposite to the Luxation, and Extensions are to be made, by drawing both upward and downward, as before: Then the Head of the Bone is to be forc'd, by the means of a Ball thrust strongly with the Knee, in drawing the luxated Bone toward the other.

The Posterior Luxation is thus reduc'd: The Patient being laid upon his Belly, the double Extension is to be made, and his Knee drawn outward, to set the Bone in its place. After the Operation hath been perform'd, a Bolster is to be apply'd, steep'd in Spirituous Medicaments; and the Bandage call'd *Spica*, of which we have given an Account in treating of the Luxation of the Shoulder.

CH A P. XIV.

Of the Luxation of the Knee.

WHEN the *Tibia* is luxated behind, its Prominences are in the Cavity of the Ham, and the Leg flies off, or is bended. If the same *Tibia* be dislocated on the Side, a kind of Tumour appears in the luxated Side, and a Sinking in the opposite. But if the *Condylus* of the *Tibia* remains in the inside, the Leg turns outward; and if it be in the outside, it turns inward.

The Posterior Luxation is reduc'd by obliging the Patient to lie upon his Belly, whilst the Surgeon during the Extensions bends the Leg, in drawing the Heel toward the top of the Thigh.

If the *Tibia* be luxated on the side, the usual Extensions are to be made, and the Bone is to be push'd with the Knee.

If the Luxation were in the fore-part, it would be requisite to lay the Patient upon his Back, to make the Extensions, by drawing the Thigh and Leg, and to press the protuberant Parts.

The Bandage

Is prepar'd with a Band three Ells long, and two Fingers broad, roll'd with two Balls; A Circumvolution being at first made above the Knee, an X must be made underneath, and a Circumvolution above it; then the Band is carry'd up again over the Knee, making Edgings and X's underneath, till the Knee be entirely cover'd.

C H A P. XV.

*Of the Luxation of the Rotula, or
Knee-Pan.*

THE Knee-Pan is luxated by starting upward: and to reduce it, the Patient's Leg must be held streight, whilst it is thrust back into its Place with the Hands. Then he must be oblig'd to keep his Bed, and the same Bandage is to be apply'd with that which hath been describ'd for the Luxation of the Knee.

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If the *Perone* or *Fibula* be remov'd from the *Tibia*, the sides of the Foot are to be press'd to draw it back again; and it may be kept close with the Bandage, which is appropriated to the Fractures of the *Tarsus*.

The *Astragalus* may be also luxated in the fore-part; so that the Operator ought to thrust it back into its Place, and to make use of the Bandage which we have prepar'd for the Fracture of the Foot.

The *Calcaneum* sometimes flies off from the *Astragalus* both in the Inside and without; and the Bones of the *Tarsus*, *Metatarsus*, and Toes are likewise apt to be luxated. But a little Circumspection is only requisite to reduce all these Dislocations.

CH A P. XVI.

An Excellent Discourse on the Rickets, deliver'd by Monsieur Arnaud in the Amphitheatre of St. Cosmus.

M. Arnaud shew'd in the Amphitheatre of St. Cosmus on the Bones of Ricketty Children, which are always larger below than above, that they almost ever break in the Places where they bend, and agglutinate again when they grow, and strengthen, which he prov'd by exposing them broken to the View of the Com-

Company or shewing the Circular Lines in the Places where they knit again together. He shew'd these Bones warp to that side to which they naturally bend, as toward the last end of the Spine outwardly, towards the Anterior part of the Bone of the Thigh &c. or if they are naturally streight, as the Bones of the Leg or Arm, they are bowed on the side opposite to the Contraction of the strongest Muscles. The Arm bone, for instance, is bow'd to the Outside, because the strongest Muscles lying on the Inside, draw its Extremities together as the String of a Bow.

When very young Children have their Bones thus bow'd, Splints may do well enough to bring them right; but when they come to Three or Four Years old, you must make use of a Boot.

This must go but half round the Leg. The hinder part must be open to put the Leg into the Machine, which must be clos'd behind with three Straps fastned at convenient Distances.

This Boot has two Elongations on each side which are pretty narrow. The Stirrup which passes under the Child's Foot is a Leather, which is fasten'd to each side of the Boot, to the upper End of this a Knee-Piece must be lac'd.

This is made of Tin, and must have a Hole in the middle for the Knee to pass thro': It must be accommodated so as to follow the Motion of the Knee, and give way for its Flexion and Extension when the Child walks.

Within this there must be another small Boot of Tin like the former. This must be lined on the Inside with Rastian, and have a Hole in the Place where the Curvature of the Leg is, to prevent compressing it, and to give it way to go and support itself on the External Boot, and its Lining.

This Description is sufficient to give any Workman an Idea of this Machine.

to the Outside because the strongest Muscles are on the Inside of the Leg. The Spring of a Bow is the Spring of a Bow. Children have their Bones very young. Spines may be well come to Three or Four Years old, you must make use of a Boot.

This must go but half round the Leg. The Under part must be open to put the Leg into the Machine, which must be closed behind with three Straps fastened at convenient Distances.

A This Boot has two Blisters on each side which are pretty narrow. The Spring which passes under the Child's Foot is a Leather, which is fastened to each side of the Boot to the upper End of this a Knee-piece must be added.

This is made of Tin, and must have a Hole in the middle for the Knee to pass thro': It must be fastened to the Boot by two Straps, one at the Knee, and give way for its Flexion and Extension when the Child walks.

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TREATISE

OF

Medicinal Compositions

Necessary for a

SURGEON.

CHAPTER I.

Of Balsams.

The Balsam of Arcaus.

TAKE two Pounds of the Suet of a He-Goat, Venice Turpentine and Gum Elemi, a Pound and a half of each; and of Hog's-Lard one Pound. After the Gum Elemi, being cut into small Pieces, hath been melted over a very gentle Fire, add to it the Turpentine, Goats-Suet and Swines-Grease;

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Grease; and when all these Ingredients are well dissolv'd, strain the Liquor thro' a new Linnen-Cloth, to separate the Scum and Dregs from it; then let the whole Mass cool, and the Balsam is made.

This Balsam serves to incarnate and consolidate all sorts of Wounds and Ulcers: It is likewise us'd in Fractures and Dislocations of the Bones; as also to cure the Contusions and Wounds of the Nerves.

The Balsam of Spain.

Take pure Wheat, the Roots of *Valerian* and *Cardus Benedictus*, of each one Ounce, and beat 'em well in a Mortar with a Pint of White-wine; strain the whole Composition into an Earthen Vessel glaz'd, having a narrow Mouth; stop up the Vessel, and set it upon hot Embers during twenty four Hours: Then add six Ounces of *St. John's-Wort*; set the whole Mass in *Balneo Mariæ*, till the Wine be consum'd, and let it be strain'd and squeez'd. Afterward add two Ounces of Frankincense well pulveriz'd, with eight Ounces of *Venice-Turpentine*, mixing 'em together over a gentle Fire, and the Balsam will be made.

This is the Balsam which was always us'd by *Fabritius ab Aquapendente*; and is excellent for all kinds of Wounds, even for the Nervous, which (as it is avouch'd by some Persons) may be cur'd by it within the space of twenty four Hours. But the Wound must be at first wash'd with good White-Wine cold, and afterward a-

nointed

ointed with this Balsam well heated. If the Wound be deep, it may be syringed with the same Balsam very hot, and the sides of it appointed when drawn together. Then a Bolster steep'd in the Balsam is to be apply'd to the Part, and upon that another Bolster soak'd in the Lees of Wine; as also over this last another dry Bolster.

The Green Balsam.

Take Linseed-Oil and that of Olives, of each one Pint; one Ounce of Oil of Bays; two Ounces of Venice-Turpentine, half an Ounce of the distill'd Oil of Juniper-berries, three Drams of Verdegrease, two Drams of Sucotrin Aloes, two Drams and a half of White-Vitriol, and one of the Oil of Cloves.

Having made choice of the best Olive and Linseed-Oil well purify'd and mingl'd together in a Skillet or Pan over a very gentle Fire, let the Turpentine and Oil of Bays be incorporated in it: then having taken off the Pan from the Fire, and left the Liquor to be well cool'd, let it be intermix'd by little and little with the Verdegrease, the White-Vitriol and the Sucotrin Aloes beaten to fine Powder: Afterward the distill'd Oils of Cloves and Juniper-berries being added, and the whole Composition well mingl'd together, the Balsam will be intirely compounded according to Art.

This is the Balsam that hath been so much talk'd of at *Paris*, and which many Quack-Salvers, pretending to the Arts of Physick and Sur-

gery, keep as a great Secret. Indeed it is very good for all sorts of Wounds, whether they be made by the Sword, or other Iron Weapons, or by Gun-shot. But it would be requisite at first to wash the Wound with warm Wine, then to anoint it with this Balsam very hot, and to apply Bolsters that have been steep'd in it, as also a large Bolster over the other, dipt in some styptick Liquor. This Balsam mundifies, incarnates and cicatrizes Wounds; being likewise good against the bitings of venomous Beasts, and fistulous and malignant Ulcers.

Samaritan Balsam.

Take an equal Quantity of common Oil and good Wine; boil 'em together in a glaz'd Earthen Vessel, till the Wine be wholly consum'd, and the Balsam will be made. I have mention'd this Balsam in particular, by reason of its simplicity, and in regard that it may be readily prepar'd at all times. It serves to mundifie and consolidate simple Wounds more especially those that are recent.

CHAP.

C H A P. II.

Of Ointments.

Unguentum Althææ.

TAKE of the Roots of *Althæa*, or Marsh-Mallows six Ounces; Linseed and Fenugreek-seed, and Squils, of each four Ounces; of yellow Wax one Pound; Colophony and Rosin, of each one Pound; Venice Turpentine, Galbanum, and Gum *Hedera* pulveriz'd, two Ounces of each. The Marsh-Mallow-Roots being newly gather'd, are to be well wash'd and slic'd, as well as the Squils. After they have been put into a Copper-Pan or Skillet, tinn'd over on the inside, together with the Linseed and Fenugreek-seed, and a Gallon of fair Water pour'd upon 'em, the whole Mals is to be macerated during twenty four Hours, over a very gentle Fire, stirring the Ingredients from time to time with a Wooden *Spatula*: Thus they are to be boil'd slowly, often reiterating the stirring, till the Macilages are sufficiently thicken'd; then, after having well squeez'd and strain'd 'em through a strong and very close Cloth, and mingl'd 'em with the prepar'd Oil, they are to be boil'd together again over a very gentle Fire, till the Superfluous Moisture be wholly consum'd: Afterward having strain'd the Oil again, the yellow Wax,

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Colophony, and *Rosin* cut into small Pieces, are to be melted in it; and if any Dregs appear at the bottom of the Pan, when the whole Mass is dissolv'd, it is to be strain'd a-new, or at least the pure Liquor must be separated from the gross or impure by Inclination, whilst it is as yet very hot. The Ointment must be stirr'd about with a wooden Pestle; and when it begins to grow thick, you may add the *Turpentine*, the *Galbanum* purify'd and thicken'd, and the Gum *Hedera* beaten to fine Powder, all which Ingredients were before incorporated together. Then the Ointment is to be continually stirr'd, till it be altogether grown cold.

This Ointment serves to moisten, mollifie and heat gently; it also allays the Pains of the Side, and softens Tumours, particularly the *Parosides*. It may be us'd either alone or with other Ointments or Oils.

The Mundificative Ointment of Smallage.

Take three handfuls of *Smallage*-Leaves; with *Ground-Ivy*, great *Wormwood*, great *Centory*, *Germander*, *Sage*, *St. John's-Wort*, *Plantain*, *Milfoil*, or *Yarrow*, *Perewinkle*, the greater *Comfrey*, the lesser *Comfrey*, *Betony*, *Honey-suckle*, *Fluellin*, *Vervein*, *Knot Grass*, *Adders-Tongue*, and *Burnet*, of every one of these Plants two Handfuls; a Gallon of common Oil, white Pitch, Mutton-Suet, yellow Wax, and *Turpentine*, of each two Pounds.

Bruse all these Herbs in a Marble Mortar; let the Wax, white Pitch, and Mutton-Suet be cut into pieces, as also the *Turpentine* be melted in

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the Oil in a Copper Pan tinn'd on the Inside, over a moderate Fire; put the Bruis'd Herbs in it, and cause the whole Mass to simmer together very slowly, stirring it about from time to time with a wooden *Sparula*. As soon as it shall be perceiv'd that the Oil of the Herbs is almost quite consum'd, the whole Composition is to be strain'd and strongly squeez'd. Then after having let the Ointment cool to draw off all the Dregs and Moisture; melt it over a very gentle Fire; and after having left it a little while to cool again and thicken, you may add thereto Myrrh, Aloes, *Florence Oris*, and round Birth-wort pulveriz'd very fine. When all these Ingredients are by this means well incorporated, the Ointment will be brought to Perfection.

This Ointment is of singular Use to cleanse Ulcers; as also to mundifie, cicatrize, and consolidate all sorts of Wounds.

The black or suppurative Ointment.

Take a Quart of common Oil, white and yellow Wax, Mutton-Suet that lies near the Kidneys, pure Resin, Ship-Pitch, Venice-Turpentine, of each half a Pound; and of Mastick beaten to fine Powder, two Ounces; let all that is capable of being dissolv'd, be melted in the Oil; and add the Powder of Mastick to make an Ointment.

This Ointment searches and opens all sorts of Impostumes, as well as Carbuncles, and Pustulentia and Venereal Bubo's. The use of the same Ointment is also to be continu'd after the opening of the Abscesses, till their perfect Cure be compleated.

Un-

Unguentum Rosatum.

Take Boar's-Grease well purify'd, and often wash'd, and Red Roses newly pick'd, of each four Pounds, with the like Quantity of White Roses.

The thin Membrane or Skin which lies upon the Boar's-Grease, being taken away, it is to be cut into small pieces, well wash'd in fair Water and melted in a Glaz'd Earthen-pot over a very gentle Fire: the first Grease that is dissolv'd is to be strain'd thro a Cloth, well wash'd, and mixt with the same Quantity of thick Rose-buds well bruis'd. Then the whole Mass is to be put into a glaz'd Earthen-Pot with a narrow Mouth, the Pot is to be well stop'd, and set during six Hours in Water, which is between luke-warm and boiling-hot. Afterward it is to be boil'd an Hour, strain'd and strongly squeez'd. In the mean while four Pounds of white Roses newly blown are to be taken, well bruis'd, and mingl'd with the former Composition, the Pot being cover'd, which is likewise set for the space of six Hours in Water, between luke-warm and boiling-hot: Then the Liquor is to be strain'd and strongly squeez'd. Lastly, after the Ointment hath been cool'd, and separated from its *Feces* or Dregs, it may be kept for use.

If it be desir'd to give a Rose-Colour to this Ointment, it wou'd be requisite a quarter of an Hour before it be strain'd the last time, to throw into it two or three Ounces of *Orcanet*, which is to be stirr'd into the Ointment. If it be thought fit to retain the White Colour, and to produce the

the smell of Roses, it may be done with Damask-Roses without Orcanet. If you are desirous to give it the Consistence of a Liniment, you may add Oil of sweet Almonds to the Quantity of a sixth part of its Weight.

This Ointment is a very good Remedy against all manner of external Inflammations, particularly against *Pblegmons*, *Erysipela's*, and *Tetters*; as also against the Head-ach and Hemorrhoids or Piles.

Unguentum Album, aut de Cerussa.

Take three Pints of Oil of Roses, nine Ounces of white Wax, one Pound of Venice Ceruse or white Lead, and a Dram and a half of Camphire.

The Ceruse being pulveriz'd by rubbing the pieces upon the Cloth of a Hair-Sieve turn'd upside down; the Powder is to be receiv'd on a Sheet of Paper laid underneath, and to be often wash'd with Water in a great Earthen Pan, stirring it about with a Wooden *Spatula*, and pouring off the Water by Inclination as soon as the Powder is sunk to the bottom. When the Water of these Washings grows insipid, the last Lotion is to be made with Rose-Water, leaving it for the space of five or six Hours, which being expir'd, it is to be pour'd off by Inclination, and the Ceruse must be dry'd in the Shade, cover'd with Paper. Then the broken Wax and prepar'd Oil is to be put into a glaz'd Earthen-Pot, and the Pot into the boiling Bath: As soon as the Wax is melted, the Pot may be taken out of the Bath, and the dissolv'd Liquor stirr'd with a wooden Pestle

Pestle till it begins to grow thick. Afterward let the pulveriz'd Ceruse be infused, and the Ointment stir'd about till it be almost cold. If you shall think fit to add Camphire, let it be dissolv'd in a little Oil, and incorporated with the Ointment when it is cold. The Whites of Eggs may be also well mixt with the Ointment, by stirring it about, to make an exact Union of the several Ingredients.

This Ointment is good for Burns, *Erysipelas*, the Itch, and many Distempers of the Skin; it allays the Itchings and Heats of Ulcers; it dissipates the Chafings and Redness that happen in the Bodies of Infants; it is of great efficacy in the Healing of Contusions, and it serves to consolidate and cool light Wounds.

Unguentum Aegyptiacum.

Take eleven Ounces of Verdegrease, fourteen Ounces of strong Vinegar, and twenty eight Ounces of good Honey.

Let the Verdegrease be put into a Copper-Pan or Skillet over a very gentle Fire: then bruise it with a wooden Pestle, work it well in the Vinegar, and strain the whole thro' a Hair-Sieve. If a little Verdegrease remains on the Sieve, it is to be put again into the Skillet, bruised and beaten small therein, as before, with a Portion of the same Vinegar, straining it thro' the Sieve, till the Unprofitable drossy Parts of the Copper be only left. Afterward, this Liquor is to be boil'd over a gentle Fire, with the Honey, stirring it about from time to time till it hath acquir'd the Consistence of a softish Ointment, and a very red Colour.

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This Ointment consumes putrify'd Flesh, and the Superfluities of Ulcers and Wounds.

Unguentum Basilicon, or Royal Ointment.

Take yellow Wax, Mutton Suer, Rosin, Ship-pitch, and *Venice* Turpentine, one Pound of each; with five Pints of common Oil.

Cut the Suer, Rosin and black Pitch into small Pieces, and let 'em be melted together, with the Oil, in a Copper-Pan, over a very moderate Fire; then after having strain'd the Liquor thro' a thick Cloth, let it be incorporated with the Turpentine, and the Ointment will be made.

It promotes Suppuration, and cicatrizes Wounds when the purulent Matter is drawn forth. It is sometimes us'd alone to Arm Pledgits; and sometimes mix'd with the Yolks of Eggs, Turpentine, and other Ointments, or with Oils and Plaisters.

A Cooling Cerate.

Take a Pint of Oil of Roses, and three Ounces of white Wax.

Let the whole Composition be put into a glaz'd Earthen Pot, and the Pot set in *Balneo Maria*, till the Wax be well dissolv'd in the Oil: then take the Vessel out of the Bath, and stir the Ointment with a Wooden Pestle till it be cool'd; add Two ounces of Water and stir it about with the Pestle till it be imbib'd by the Cerate; let as much more Water be infused, and again the same Quantity, till the Cerate becomes very white, and hath been well soak'd
with

with fresh Water. Afterward all the Water is to be pour'd off by Inclination, and separated as much as is possible from the Cerate, which may then be kept for use; but some Surgeons cause an Ounce of Vinegar to be mixt with it.

This Cerate is usually laid outwardly upon all Parts that stand in need of cooling, and asswages the Pains of the Hemorrhoids or Piles. It is also good for Chaps, sore Nipples, and other ill Accidents that happen in the Breast; and is us'd for Burns, either alone, or mixt with other Ointments. Whensoever it is necessary to apply Desiccatives and Astringents to any Part, this Cerate may be mixt with *Unguentum de Cerussa*.

An Ointment for Burns.

Take a Pound of Boars Grease, two Pints of White-Wine, the Leaves of the greater Sage, Ground and Wall-Ivy, Sweet-Majoram, or the greater House-Leek, of each two Handfuls.

Let the whole Mass be boil'd over a gentle Fire, and having afterward strain'd and squeez'd it, let the Ointment so made be kept for use.

CHAP.

C H A P. III.

Of Plaisters.

The Plaister of Diapalma.

TAKE Three Pounds of prepar'd Litharge of Gold, three Pints of common Oil, Two Pounds of Hogs-Lard, a Quart of the Decoction of Palm-Tree or Oak-Tops; four Ounces of Vitriol calcin'd till it become red, and steep't in the said Decoction. Having bruisd or cut very small Two Handfuls of Palm-Tree or Oak-Tops; let them be boil'd slowly in three Quarts of Water till about half be consum'd; and after the whole Mass hath been well squeezed, the strain'd Decoction is to be preserv'd. In the mean time the Litharge is to be pound'd in a Great Brass Mortar, and dilut'd with Two or Three Quarts of clear Water; but it will be requisite readily to pour out into another Vessel the muddy Water which is impregnated with the more subtil part of the Litharge whilst the thicker remains at the bottom of the Mortar; whereupon this part of the Litharge will sink to the bottom of the Water, and the Litharge remaining in the Mortar is to be pound'd again. Then having dilut'd it in the Water of the first Lotion, or in some other fresh Water, the

the muddy Liquor is to be pour'd by Inclination upon the subril Litharge that remain'd in the bottom of the Vessel : Afterward you may continue to pound the Litharge to bruise it in the Water, to pour it off by Inclination, and to let the Powder settle till there be left only at the bottom a certain impure part of the Litharge, capable of being pulveriz'd, and rais'd amidst the Water. As soon as the Lotions are well settl'd, and care hath been taken to separate by Inclination the Water which swims over the Powder of Litharge ; this Powder is to be dry'd, and having weigh'd out the appointed Quantity, it is to be put as yet cold into a Copper-Pan tinn'd within, and stirr'd about to mingle it with the Oil, Lard, and Decoction of Palm-Tree Tops. When these Ingredients have been well incorporated together, a good Charcoal Fire must be kindl'd in a Furnace, over which they are to be boil'd, stirring it continually with a great Wooden *Spatula*, and constantly maintaining an equal Degree of Heat during the whole time of their boiling. At last you may add the rubify'd Vitriol dissolv'd in a Portion of the Liquor that hath been reserv'd, if you wou'd have the Plaister tinctur'd with a red Colour ; or else white Vitriol melted in the same Decoction, it it shall be thought fit to retain the Whiteness of the Plaister, which may be form'd into Rolls, and wrapp'd up with Paper.

This Plaister is us'd for the Cure of Wounds, Ulcers, Tumours, Burns, Contusions, Fractures, and Chilblains, and is also used for Issues. If you mingle with it the Third or Fourth part of its Weight of some convenient Oil, it will attain

attain to the Consistence of a Cerate; and this is that which is call'd *Dissolved Diapalma*, or *Cerate of Diapalma*.

The Plaister of Simple Diachylum.

Take of Marsh-Mallow-Roots peeld, three Drams; Linseed and Fænugreek-seed, of each Four Ounces; Three Quarts of Spring-Water; two Quarts of common Oil, and two Pounds of Litharge of Gold.

Let the Mucilages of Marsh-Mallow-Roots, and of the Linseed and Fænugreek-seed be taken, as hath been shewn in the making of *Unguentum Althææ*, and let the Litharge be prepar'd after the same manner as for the Plaister of *Diapalma*. Having at first well mix'd the Oil with the Litharge in a large Copper Vessel or Pan, tinn'd on the inside, being wide at the top, and tapering like a Cone toward the bottom, as also having afterward added and well incorporated the Mucilages, a moderate Charcoal Fire is to be kind'd in a Furnace, upon which the Vessel is to be set and the whole Mass is to be stirr'd about incessantly with a wooden *Spatula*; and as fast as is possible. A gentle Fire is to be maintain'd, and the Boiling and Agitation to be continu'd, till it be perceiv'd that the Plaister begins to sink in the Pan; then the heat of the Fire must be diminish'd one half at the least; and it will be requisite only to cause an Evaporation by little and little, of the Superfluous Moisture that might remain in the Plaister, which being consum'd, is a Mark it is sufficiently boiled, especially if it have attained to its due Consistence and Whiteness.

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This Plaister softens and dissolves hard Swellings, and even the Scirrhouſ Tumours of the Liver and Bowels; such are the Scrophulous or King's Evil Tumours, the old remains of Abscesses, &c.

The Plaister of Andreas Cruceius.

Take two Ounces of Rosin, four Ounces of Gum *Elemi*, Venice Turpentine and Oil of Bays, of each two Ounces.

After having beat in Pieces the Rosin and Gum *Elemi*, they are to be melted together over a very gentle Fire, and then may be added the Turpentine and Oil of Bays. When the whole Mass hath been by this means well incorporated, it must be strained through a Cloth, to separate it from the Dregs. The Plaister being afterward cool'd, is to be made up in Rolls, and kept for use.

This Plaister is proper for Wounds of the Breast: It also mundifies and consolidates all sorts of Wounds and Ulcers, dissipates Contusions, strengthens the Parts in Fractures and Dislocations, and causeth the Serous Humours to pass away by Transpiration.

Emplastrum Divinum.

Take of Litharge of Gold prepar'd, one Pound and an half; three Pints of common Oil; one Quart of Spring-Water; six Ounces of prepar'd Load-Stone, Gum *Ammoniack*, *Galbanum*, *Opeponax*, and *Bdellium*, of each three Ounces; Myrrh, *Olibanum*, Mastick, Verdegrease, and round

round Birth-wort, of every one of these an Ounce and an half ; eight Ounces of Yellow Wax, and for Ounces of Turpentine.

Let the Gum *Ammoniack*, *Galbanum*, *Bdellium*, and *Opoponax* be dissolv'd in Vinegar, in a little Earthen Pipkin ; strain 'em thro' a coarse Cloth, and let 'em be thicken'd by Evaporation, according to the Method before observ'd in other Plaisters : Then prepare the Loadstone upon a Porphyry or Marble-Stone, and take care to bruise separately the *Olibanum*, the Mastick, the Myrrh, the round Birth-Wort, and the Verdegrease, which is to be kept to be added at last. In the mean while, having incorporated cold the Oil with the Litharge, and mingled the Water with 'em, they are to be boil'd together over a very good Fire, stirring 'em incessantly, till the whole Composition hath acquir'd the Consistence of a somewhat solid Plaister, in which is to be dissolv'd the Yellow Wax cut into small Pieces. Afterward having taken off the Pan from the Fire, and left the Ingredients to be half cool'd, intermix the Gums, which have been already thickened and incorporated with the Turpentine ; then Load-Stone mingled with the Birth-Wort, Myrrh, Mastick, and *Olibanum* ; and last of all the Verdegrease. Thus when all these Ingredients are well stirr'd and mix'd together, the Plaister will be entirely compounded ; so that it may be made upon necessary Occasions.

This Plaister is efficacious in curing of all kinds of Wounds, Ulcers, Tumours, and Contusions ; for it mollifies, digests, and brings to Suppuration such Matter as ought to be carry'd off this way. It also mundifies, cicatrizes, and entirely consolidates Wounds, &c.

CHAP.

C H A P. IV.

Of Cataplasms or Pultisses.

CATAPLASMS are usually prepar'd to assuage Pain; as also to dissolve and dissipate recent Tumours, and are made thus:

Take four Ounces and a half of white Bread, one Pint of new Milk, three Yolks of Eggs, one Ounce of Oil of Roses, one Dram of Saffron, two Drams of the Extract of *Opium*.

The Crumb is to be taken out of the inside of a white Loaf newly drawn out of the Oven, and to be boild with the Milk in a Skillet over a little Fire, stirring it from time to time with a *Spatula*, till it be reduc'd to a thick Pap. After having taken the Vessel off from the Fire, the three Yolks of Eggs beaten are to be put into it, and the Dram of Saffron pulveriz'd; to these Ingredients may be added two Drams of the Extract of *Opium* somewhat liquid, if the Pain be great.

Here is another Cataplasm proper to mollify and to bring to Suppuration when it is necessary.

Take White-Lilly-Roots and Marsh-Mallow-Roots, of each four Ounces; the Leaves of common Mallows, Marsh-Mallows, Groundsel, Violet-Plants, Brank-Ursh, of every one of these

Herbs

Herbs one handfull; the Meal of Line, Fenugreek, and Oil of Lillies, of each three Ounces.

The Roots when wash'd and slic'd, are to be boil'd in Water, and the Leaves being added some time after, the Boiling is to be continu'd till the whole Mass becomes perfectly tender and soft; at which time having strain'd the Decoction, beat the remaining gross Substance in a Stone Mortar, with a Wooden Pestle, and pass the Pulp through a Hair Sieve turn'd up-side down: Then let the Decoction and Pulp so strain'd be put into a Skillet, and having intermixt the Meal of Line, Fenugreek, and Oil of Lillies; let 'em be boil'd together over a gentle Fire, stirring about the Ingredients from time to time, till they be all sufficiently thicken'd. These two Cataplasms may serve as a Model for the making of many others.

CHAPTER V.

Of Oils.

OILS are made either by Infusion or Expression.

Simple Oil of Roses made by Infusion.

Take two Pounds of Roses newly gather'd, and bruise'd in a Mortar; half a Pint of the Juice of Roses, and five Pints of common Oil: Let the whole Composition be put into an Earthen Vessel leaded

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leaded and well stop't, and then let it be expos'd to the Sun during forty Days. Afterward let it be boild in *Balneo Mariae*; and having strain'd and squeez'd the Roses, let the Oil be kept for use.

Compound Oil of Roses made by Infusion.

Take a Pound of Red Roses newly gather'd, and pound 'em in a Mortar; as also four Ounces of the Juice of Red Roses, and two Quarts of common Oil. Let the whole Composition be put into an Earthen Vessel leaded, the Mouth of which is narrow, and well stop't; and then having expos'd it to the Sun during four Days, let it be set in *Balneo Mariae* for an Hour, and then strain'd and squeez'd. Afterward, let this Liquor be put into the same Vessel, adding to it the Juice of Roses, and Roses themselves, in the same quantity as before: Let the Vessel be stop't; let the Maceration, Boiling, Straining, and Expression be made in like manner as before; and let the same Operation be once more reiterated: Then let your Oil be depurated, and preserv'd for use.

These Oils repel and discuss Defluxions of Humours, suppress Inflammations, mitigate the Head-ach and *Deliriums*, and provoke to sleep. They must be warm'd before the Parts are anointed with 'em; and they may be given inwardly against the Bloody-flux and Worms, the Dose being from half an Ounce to a whole Ounce. The Parts are also anointed with 'em in Fractures and Dislocations of the Bones, and *Oxyrodina* are made of 'em with an equal quantity of Vinegar of Roses.

Oil

Oil of Sweet-Almonds made by Expression.

Take new Almonds that are fat and very dry without their Shells, and having shaken 'em in a somewhat thick Sieve, to cause the Dust to fall off, let 'em be put into hot Water till their Skins become tender, so that they may be separated by squeezing 'em with the Fingers. Afterward having peeled them, let them be wiped with a white Linnen-Cloth, and spread upon it to be dry'd: Then they are to be put into a Stone Mortar and pounded with a Wooden Pestle, till the PASTE grows very thin, and begins to give Oil: This PASTE is to be put into a little Linnen Bag, new and strong, the Mouth of which hath been well ry'd; and the Bag is to be plac'd between two Platines of Tin, or of Wood lin'd on the inside with a Leaf of Tin, squeezing the whole Mass gently at first; but afterward very strongly, and leaving it for a long while in the Press, that the Oil may have time to run out.

This-Oil mitigates the Nephritick Colicks, remedies the Retention of Urine, facilitates Child-birth, allays the After-pains in Women newly deliver'd, and the Gripes in young Infants: It is taken inwardly fasting from half an Ounce to two Ounces; and it is us'd in Liniments to assuage and mollifie. The Oils of common Wall-Nuts and Small-Nuts, may be also prepar'd after the same manner as that of Sweet-Almonds.

The Oil of Bayes.

Take as much as you please of Laurel or Bay-berries, well cleans'd, perfectly ripe, and soundly bruisd; let 'em be put into a Kettle, and boild with a sufficient quantity of Water during half an Hour; then strain and squeeze 'em strongly; let the Liquor cool, and scum off the Fat that swims upon the Water: Afterward pound the remaining Substance in a Mortar, and cause it to be boild again for half an Hour, with some of the first Water which was left, adding a little fresh; then strain and squeeze it as before, and rake off the Oil that swims on the top. But the first Oil is better than the second, and therefore ought to be kept separately. The Oils of Berries of Mastick, Myrtle, and other oleaginous Plants may be extracted after the same manner.

The Oil of Bayes mollifies, attenuates, and is opening and discutient: It is very good against the Palse, and the Shiverings or cold Fits of a Fever or Ague, if the Back be anointed with it; as also against Scabs, Tettors, &c.

The Oil of Eggs by Expression.

Take newly laid Eggs, and let 'em be hardned in Water; then separate the Yolks, and put 'em into a Frying-pan over a gentle Coal-Fire, stirring 'em about from time to time, and at last without discontinuing, till they grow reddish, and begin to yield their Oil: Then they are to be sprinkled with Spirit of Wine, and pour'd ve-

ry hot into a little Linnen-bag, which is to be ty'd and set in a Press between two Plates heated. so that the Oil may be Squeez'd out as readily as is possible.

This Oil mitigates the Pains of the Ears and Haemorrhoids, cures Scabs, and Ring-Worms, or Tettters; as also Chaps and Clefts in the Breast, Hands, Feet, and Fundament; and is made use of in Burns, &c.

CHAP. VI.

Of Collyrium's.

COLLYRIUMS are Medicines prepar'd for the Diseases of the Eyes: The following taken from *Lanfrancus*.

Take a Pint of White-Wine, three Pints of Plantain-Water, three Pounds of Roses, two Drams of *Orpiment*, one Dram of *Verdegrease*; Myrrh and Aloes, of each two Scruples.

The *Orpiment*, *Verdegrease*, Myrrh, and Aloes are to be beaten to a fine Powder before they are intermixt with the Liquors. This *Collyrium* is not only good for the Eyes, but is also of use to make Injections into the Privy-parts of Men and Women; but before the Injections are made, it ought to be sweeten'd with three or four times the quantity in weight of Rose, Plantain, or Morel-Water.

A dry Collyrium.

Take two Drams of Sugar-candy ; prepar'd Tutty, Lizard's Dung ; of each one Dram ; White Vitriol, Succotrin Aloes, and *Sal Saturni*, of each half a Dram. -

Let the whole Composition be reduc'd to a very fine Powder, and mixt together : Two or three Grains of this may be blown at once into the Eye with a small Quill, Pipe of Straw or Reed, as long as it is necessary ; and the same Powder may also be steep't in Ophthalmick Waters, to make a liquid *Collyrium*.

A Blue Collyrium.

Take a Pint of Water in which unslackt Lime has been quench'd, and a Dram of *Sal Ammoniack* pulveriz'd ; mingle these Ingredients together in a Brass Bason, and let 'em be infus'd during a whole Night ; then filtrate the Liquor and keep it for use.

This *Collyrium* is one of the best Medicines that can be prepar'd for all manner of Diseases of the Eyes.

CHAP. VII.

Of Powders.

A Powder against Madnes or Frenzy.

TAKE the Leaves of Rue, Vervein, the lesser Sage, Plantain, Polypody, common Wormwood, Mint, Mother-Wort, Balm, Betony, St. John's Wort, and the lesser Centory; of every one an equal quantity.

These Plants must be gather'd in the Month of June, during the clear and serene Weather, and ty'd up in Nose-gays or little Bundles, which are to be wrap'd up in Paper, and hung in the Air to be dry'd the Shade. Afterward they are to be pounded in a great Brass Mortar, and the Powder is to be sifted thro' a Silk-Sieve.

The Dose of this Powder is from two to three Drams, mingled with half a Dram of the Powder of Vipers, in half a Glasse of good White-Wine every Morning fasting, for fifty on Day successively. It has an admirable effect, provided the wounded Person be not hit in the Head nor Face, and that the Wound has not been wash'd with Water.

C H A P. VIII.

Styptick-Water.

TAKE *Calcothar* or Red Vitriol that remains in the Retort after the Spirit has been drawn off, burnt Allom, and Sugar-candy, of each thirty Grains; the Urine of a young person, and Rose-Water, of each half an Ounce; and two Ounces of Plantain-Water: Let the whole Mixture be stirr'd about for a long time, and then put into a Vial. But the Liquor must be pour'd off by Inclination when there shall be occasion to take any for use.

If a Compress steep'd in this Water be laid upon an open Artery, and held close with the Hand, it will soon stop the Blood; a small Tent may be also soakt in it, and put up into the Nose for the same purpose. If it be taken inwardly, it stops the spitting of Blood, and the Dysentery or Bloody Flux; as also the Hæmorrhoidal and Menstruous Fluxes; the Dose being from half a Dram to two Drams, in Knot-Grass-Water.



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**MED. CHIR. SOC.
ABERDEEN.**

THE END OF THE TABLE

